Vol. 918 Number 4

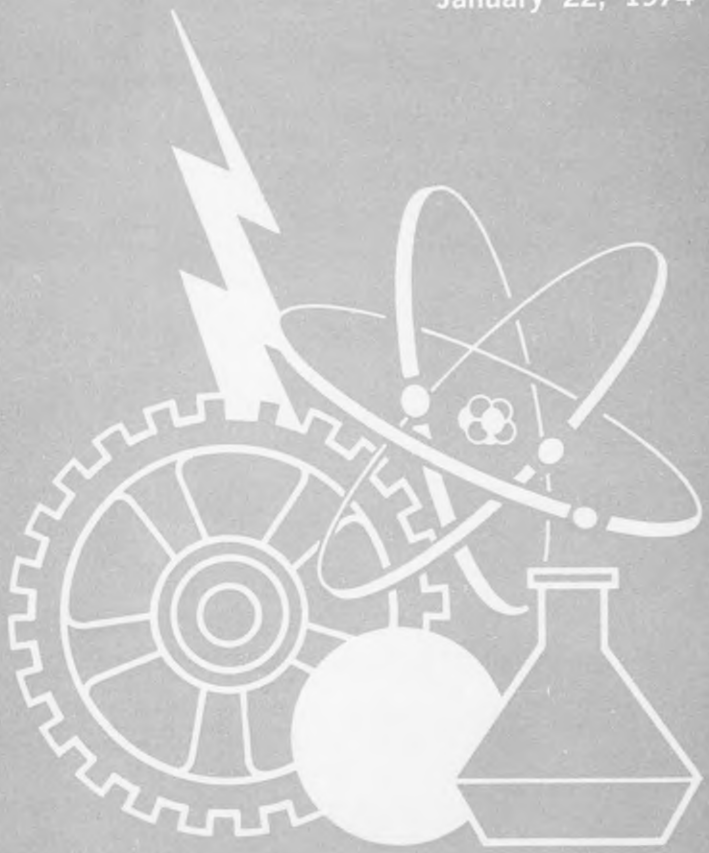
OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

January 22, 1974



U. S. DEPARTMENT OF COMMERCE
Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

January 22, 1974 Volume 918 Number 4

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PATENT NOTICES

Certificates of Correction for the Week of Jan. 22, 1974

P.P. 3,190	3,723,516	3,740,878	3,748,141
P.P. 3,347	3,723,812	3,741,089	3,748,640
Re. 27,659	3,725,026	3,741,174	3,748,818
D. 228,119	3,726,697	3,741,799	3,749,381
3,610,864	3,726,851	3,741,967	3,749,612
3,614,608	3,727,574	3,742,001	3,749,735
3,615,359	3,727,665	3,742,138	3,749,817
3,616,325	3,727,705	3,742,354	3,749,997
3,627,872	3,727,809	3,742,576	3,750,371
3,642,823	3,727,810	3,743,019	3,750,616
3,644,593	3,728,011	3,743,041	3,750,749
3,653,225	3,728,106	3,743,243	3,752,321
3,654,319	3,728,550	3,743,250	3,752,438
3,655,437	3,728,626	3,743,262	3,752,700
3,655,465	3,729,853	3,743,596	3,752,711
3,655,553	3,730,184	3,744,460	3,752,940
3,656,283	3,731,561	3,744,924	3,753,253
3,679,775	3,731,981	3,745,248	3,753,730
3,680,472	3,732,009	3,745,444	3,754,422
3,685,342	3,732,215	3,745,493	3,754,500
3,686,027	3,732,257	3,745,651	3,754,992
3,687,023	3,732,859	3,745,824	3,755,103
3,692,514	3,733,073	3,746,003	3,755,175
3,695,526	3,734,980	3,746,052	3,755,295
3,699,143	3,735,084	3,746,075	3,755,388
3,699,186	3,735,165	3,746,240	3,755,404
3,715,451	3,735,657	3,746,456	3,756,061
3,716,723	3,736,593	3,746,581	3,756,155
3,718,970	3,736,671	3,746,654	3,756,225
3,719,980	3,736,973	3,747,021	3,758,531
3,720,820	3,737,115	3,747,223	3,759,881
3,721,472	3,739,151	3,747,654	3,759,999
3,721,666	3,739,763	3,747,732	3,760,628
3,721,973	3,740,000	3,747,843	3,761,417
3,723,107	3,740,220	3,748,049	3,762,059
3,723,399	3,740,698	3,748,055	

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the GSA Patent Licensing Regulations.

Copies of patent applications, either paper copy (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the patent application number and the title. Requests for licensing information should be directed to the address cited with each copy of the patent application.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at $0.50 each. Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,
Patent Program Coordinator, National Technical Information Service.

U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 300 7th St., SW., Washington, D.C. 20590

Patent application 401,294. Display System Employing Digitally-Addressable GRT. Filed Sept. 27, 1973. PC $3/MF $1.45.

Patent application 412,263. De-Icing and Ice Preventive Composition and Process. Filed Nov. 2, 1973. PC $3/MF $1.45.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts., NW., Washington, D.C. 20240

Patent application 398. Removal of Mercury From Solution. Filed Sept. 19, 1973. PC $3/MF $1.45.

Patent application 398,025. Prefabricated Brick Panels. Filed Sept. 17, 1973. PC $3/MF $1.45.

Patent application 401,002. Smelting of Copper Oxides To Produce Blister Copper. Filed Sept. 26, 1973. PC $3/MF $1.45.

Patent 3,764,402. Creep-Resistant, High-Strength Zn-Al and Zn-Al-Mg Alloys. Filed Feb. 29, 1972. Patented Oct. 9, 1973. Not available NTIS.

Patent 3,764,526. Dynamics Reverse Osmosis Membranes of Ultrathin Discs. Filed Mar. 28, 1972. Patented Oct. 9, 1973. Not available NTIS.

Patent 3,764,650. Recovery of Gold From Ores. Filed Dec. 31, 1970. Patented Oct. 9, 1973. Not available NTIS.

Patent 3,767,378. Production of Rutile and Iron From Ilmenite. Filed Jan. 5, 1972. Patented Oct. 23, 1973. Not available NTIS.

Patent 3,767,782. Self-Destructing Pesticidal Formulations and Methods for Their Use. Filed Dec. 23, 1970. Patented Oct. 23, 1973. Not available NTIS.

Patent 3,767,783. Self-Destructing Pesticidal Formulations and Methods for Their Use. Filed Dec. 23, 1970. Patented Oct. 23, 1973. Not available NTIS.

Patent 3,769,185. Electrolytic Preparation of Zirconium and Hafnium Diborides Using a Molten, Cryolite-Base Electrolyte. Filed Dec. 18, 1972. Patented Oct. 30, 1973. Not available NTIS.

DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

Patent 3,487,687. Fluid Velocity Limit Gage. Filed Nov. 30, 1967. Patented Jan. 6, 1970. Not available NTIS.

Patent 3,488,018. Ducted Propulsion Units for VTOL Aircraft. Filed Mar. 13, 1968. Patented Jan. 6, 1970. Not available NTIS.

Patent 3,488,274. Electrolytic Composite Anode and Connector. Filed May 31, 1967. Patented Jan. 7, 1970. Not available NTIS.

Patent 3,488,507. Photovoltaic Detector and Method of Manufacture. Filed Apr. 15, 1966. Patented Jan. 6, 1970. Not available NTIS.

Patent 3,496,906. Day/Night Bidirectional Marine Marker. Filed Feb. 2, 1968. Patented Feb. 24, 1970. Not available NTIS.

Patent 3,497,846. Magnetic Anchor for Curved and Irregular Surfaces. Filed Dec. 27, 1967. Patented Feb. 24, 1970. Not available NTIS.

Patent 3,498,768. Rust-Inhibitive Abrasive Blasting. Filed Oct. 18, 1967. Patented Mar. 3, 1970. Not available NTIS.

Patent 3,499,240. Illuminated Grid for Backlighted Plotting Boards. Filed Feb. 21, 1967. Patented Mar. 10, 1970. Not available NTIS.

Patent 3,699,435. Signal Spectrum Generator. Filed July 26, 1971. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,699,462. Channel Combining Circuit for Synchronous Phase Detection Systems. Filed June 1, 1971. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,699,534. Cellular Arithmetic Array. Filed Dec. 15, 1970. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,699,558. Nondestructive Readout Thin Film Memory Device and Method Therefor. Filed Feb. 12, 1971. Patented Oct. 17, 1972. Not available NTIS.

Patent 3,700,269. Sexless Hose Coupling. Filed Nov. 17, 1970. Patented Oct. 24, 1972. Not available NTIS.

Patent 3,700,293. Piston Type Thrust Bearing. Filed Apr. 7, 1971. Patented Oct. 24, 1972. Not available NTIS.

Patent 3,700,350. Helicopter Cyclic and Collective Pitch Mechanism. Filed Feb. 3, 1971. Patented Oct. 24, 1972. Not available NTIS.

Patent 3,700,354. Compressor Blade Root Seal. Filed May 3, 1971. Patented Oct. 24, 1972. Not available NTIS.

Patent 3,700,409. Spot Test for Identification of Oil Contaminants in Water. Filed Apr. 23, 1971. Patented Oct. 24, 1972. Not available NTIS.

Patent 3,700,445. Photoresist Processing Method for Fabricating Etched Microcircuits. Filed July 29, 1971. Patented Oct. 24, 1972. Not available NTIS.

Patent 3,700,446. Process for Manufacture of Stripline Circuit Modules. Filed June 22, 1970. Patented Oct. 24, 1972. Not available NTIS.

[FR Doc. 73-27150; Filed 12-27-73; 8:45 am]

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 22, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-02-73
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo, Sulfur; Misc. Esters, Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-12-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-11-72
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-02-73
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-01-72
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-16-73
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	9-01-72[2]
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-02-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food: Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-17-72
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices, Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-15-73
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	2-17-72
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-08-73
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	10-10-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters, Stationery; Information Dissemination	3-02-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors: Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-12-73
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes, Sewing Machines.	9-28-72

Expiration of patents: The patents within the range of numbers indicated below expire during December 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 2,772,415 to 2,775,761, inclusive
Plant Patents ..... Numbers 1,532 to 1,542, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JANUARY 22, 1974

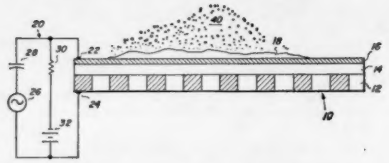
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T918,010
VIBRATING-DIAPHRAGM POWDER-CLOUD GENERATOR

Theodore H. Morse, 4352 St. Paul Blvd., Rochester, N.Y. 14617

Filed Oct. 7, 1971, Ser. No. 187,267
Int. Cl. G03g *13/08*
U.S. Cl. 118—627
1 Sheet Drawing. 13 Pages Specification



An apparatus for generating a powder cloud by vibration of a laminated diaphragm with an oscillating electrical signal. Toner particles contact or are supported on a multi-layer diaphragm which preferably comprises an uppermost thin coating of metal, e.g., aluminum, vacuum or otherwise deposited on an intermediate flexible plastic membrane which, in turn, is positioned over a perforated rigid conductive member. Toner particles deposited atop the coated membrane are physically propelled into a powder cloud above the diaphragm when an oscillating electrical signal from a power source is applied. This occurs because the oscillating signal causes the coated plastic membrane to cyclically and physically flex due to electrostatic attraction and relaxation between the two conductive layers. Linear combinations of a variety of applied electrical frequencies can be utilized to form "beats" or pulses which cause greater vibration excursions to aid in agitating the toner particles into a powder cloud.

T918,011
MOLDING RESIN COMPOSITIONS

William W. Blount, Jr., 1129 Oakleaf Drive 37663; Roger H. Calendine, 217 Elmhurst Drive 37663; and James L. Suggs, 4241 Maplewood St. 37660, all of Kingsport, Tenn.

Filed Oct. 2, 1972, Ser. No. 293,899
Int. Cl. C08b *21/08*; C08g *39/10*
U.S. Cl. 260—16
No Drawing. 10 Pages Specification

Thickened, unsaturated polyesters of 2,2,4-trimethyl-1,3-pentanediol or neopentyl glycol, a polyhydric alcohol, and maleic acid, when reacted with styrene or the like, particularly in the presence of leveling resins such as cellulose acetate butyrate, produce molded articles of good surface appearance and a high degree of pigment homogeneity. The unsaturated polyesters have a number average molecular weight of from about 1,000 to about 4,000, their glycol constituents comprise at least about 30 percent by weight of 2,2,4-trimethyl-1,3-pentanediol or neopentyl glycol or mixtures thereof, and the polyhydric alcohol constituent comprises about 1 to 20 mole percent of the glycol constituent. The polyhydric alcohol may be pentaerythritol, trimethylolpropane, trimethylolethane, glycerine, mannitol, or the like.

T918,012
COMPUTER TERMINAL MESSAGE CONTROL

Francis Michael Hartmann, Hurley, Richard Alfred Jones, Redhook, Theodore Edwin Larson, Saugerties, Kenneth Rogers McNary, Hyde Park, and James Theodore Zahorsky, Saugerties, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

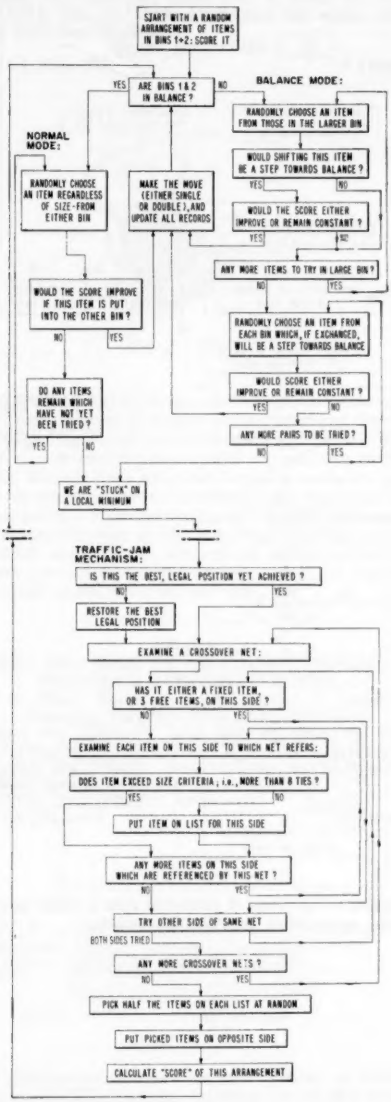
Filed Nov. 13, 1972, Ser. No. 305,744
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5
8 Sheets Drawing. 21 Pages Specification

A terminal which includes an addressable message buffer for storing fields of data; the fields being defined as a group of consecutive characters starting with a field defining character followed by alphameric characters and terminated by a field defining character which defines the beginning of the next field. The field defining character defines an attribute of the field, i.e., whether the field is protected [P] from modification by a terminal operator or unprotected [U] and therefore available for modification or entry of data. The terminal responds to a data stream which includes a single program tab order. In executing this order, the current buffer address is advanced to the address of the first character location of the next unprotected field. If the order is issued following an alphameric or null character, null characters are inserted for all the remaining characters in the current field; otherwise, no null character insertion operation takes place.

T918,013
NATURAL SELECTION PROGRAM WITH RADOMIZATION TRAFFIC-JAM MECHANISM

Bradford Dunham, White Plains, and James H. North, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1973, Ser. No. 374,620
Int. Cl. G06f *7/00*
U.S. Cl. 444—1
4 Sheets Drawing. 17 Pages Specification

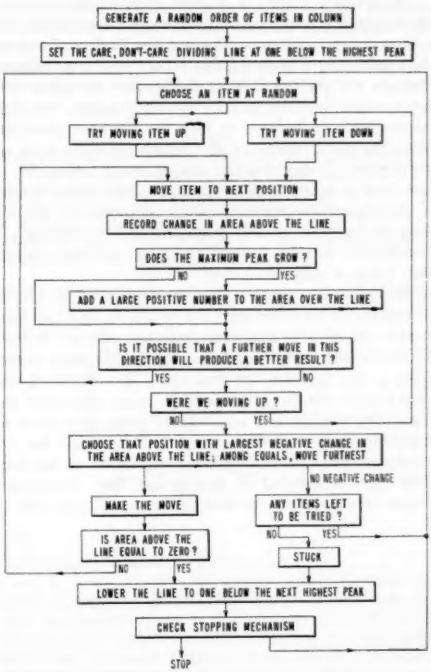

START WITH A RANDOM ARRANGEMENT OF ITEMS IN BINS 1+2; SCORE IT
ARE BINS 1 & 2 IN BALANCE ?
YES
NO
BALANCE MODE:
RANDOMLY CHOOSE AN ITEM FROM THOSE IN THE LARGER BIN
WOULD SHIFTING THIS ITEM BE A STEP TOWARDS BALANCE ?
YES
NO
WOULD THE SCORE EITHER IMPROVE OR REMAIN CONSTANT ?
YES
NO
ANY MORE ITEMS TO TRY IN LARGE BIN ?
NO
YES
RANDOMLY CHOOSE AN ITEM FROM EACH BIN WHICH, IF EXCHANGED, WILL BE A STEP TOWARDS BALANCE
WOULD SCORE EITHER IMPROVE OR REMAIN CONSTANT ?
YES
NO
ANY MORE PAIRS TO BE TRIED ?
NO
YES
NORMAL MODE:
RANDOMLY CHOOSE AN ITEM REGARDLESS OF SIZE-FROM EITHER BIN
MAKE THE MOVE (EITHER SINGLE OR DOUBLE), AND UPDATE ALL RECORDS
WOULD THE SCORE IMPROVE IF THIS ITEM IS PUT INTO THE OTHER BIN ?
NO
YES
DO ANY ITEMS REMAIN WHICH HAVE NOT YET BEEN TRIED ?
YES
NO
WE ARE "STUCK" ON A LOCAL MINIMUM
TRAFFIC-JAM MECHANISM:
IS THIS THE BEST, LEGAL POSITION YET ACHIEVED ?
NO
YES
RESTORE THE BEST LEGAL POSITION
EXAMINE A CROSSOVER NET:
HAS IT EITHER A FIXED ITEM, OR 3 FREE ITEMS, ON THIS SIDE ?
NO
YES
EXAMINE EACH ITEM ON THIS SIDE TO WHICH NET REFERS:
DOES ITEM EXCEED SIZE CRITERIA, i.e., MORE THAN 8 TIES ?
YES
NO
PUT ITEM ON LIST FOR THIS SIDE
ANY MORE ITEMS ON THIS SIDE WHICH ARE REFERENCED BY THIS NET ?
NO
YES
TRY OTHER SIDE OF SAME NET
BOTH SIDES TRIED
ANY MORE CROSSOVER NETS ?
NO
YES
PICK HALF THE ITEMS ON EACH LIST AT RANDOM
PUT PICKED ITEMS ON OPPOSITE SIDE
CALCULATE "SCORE" OF THIS ARRANGEMENT

The present invention relates to an automatic process for preventing a "natural selection" design automation computer program that is optimizing a specified objective function, for example, the location of a plurality of objects, from becoming permanently "stuck" at an unsatisfactory local minimum. The innovation presented in the disclosure is in the application of a novel "traffic-jam" routine which enables the optimization process to continue after it has reached such a local minimum. This routine operates most effectively in certain traffic-jam situations caused by unrecognized coalitions of objects where it is difficult to recognize the coalitions in question and difficult to maneuver them when unrecognized. Such coalitions can be broken up by an appropriate randomization of certain subsets of the total data, the subsets in question being demonstrably of high relevance to those unrecognized coalitions whose incorrect location has caused the unsatisfactory local minimum to be reached. The normal natural selection process may then continue to a more successful point even though the coalitions themselves remain unrecognized.

T918,014
NATURAL SELECTION METHOD FOR DESIGN AUTOMATION INCLUDING A MOVING LINE SCORER

Bradford Dunham, 300 Martine Ave., White Plains, N.Y. 10601, and James H. North, 1249 Baldwin Road, Yorktown Heights, N.Y. 10598

Filed June 29, 1973, Ser. No. 375,288
Int. Cl. G06f *15/46*
U.S. Cl. 444—1
2 Sheets Drawing. 14 Pages Specification


GENERATE A RANDOM ORDER OF ITEMS IN COLUMN
SET THE CARE, DON'T-CARE DIVIDING LINE AT ONE BELOW THE HIGHEST PEAK
CHOOSE AN ITEM AT RANDOM
TRY MOVING ITEM UP
TRY MOVING ITEM DOWN
MOVE ITEM TO NEXT POSITION
RECORD CHANGE IN AREA ABOVE THE LINE
DOES THE MAXIMUM PEAK GROW ?
NO
YES
ADD A LARGE POSITIVE NUMBER TO THE AREA OVER THE LINE
IS IT POSSIBLE THAT A FURTHER MOVE IN THIS DIRECTION WILL PRODUCE A BETTER RESULT ?
YES
NO
WERE WE MOVING UP ?
NO
YES
CHOOSE THAT POSITION WITH LARGEST NEGATIVE CHANGE IN THE AREA ABOVE THE LINE; AMONG EQUALS, MOVE FURTHEST
NO NEGATIVE CHANGE
MAKE THE MOVE
ANY ITEMS LEFT TO BE TRIED ?
NO
YES
IS AREA ABOVE THE LINE EQUAL TO ZERO ?
NO
YES
STUCK
LOWER THE LINE TO ONE BELOW THE NEXT HIGHEST PEAK
CHECK STOPPING MECHANISM
STOP

What is described is a progressive scoring mechanism for a "natural selection" design automation method

which can be embodied in a computer program for optimizing a specified objective function, for example, the location of a plurality of objects. By dividing what is scored by the optimization process at a given stage on what is defined as a "care" "don't care" basis, the program can focus attention on most troublesome points without prematurely building in structure elsewhere. At a next stage, some of the material previously treated as "don't care" is now treated as "care." Thus, the method can proceed through a sequence of stages progressively dealing with more and more of the content of the problem until an appropriate stopping point is reached. In this way, not only can worst peaks be directly attacked, but also lesser peaks and valleys can be treated in due course.

T918,015

RESCHEDULING OF I/O INTERRUPTS

Gerald A. Davison, Poughkeepsie, and Edward J. Nauss, Millbrook, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

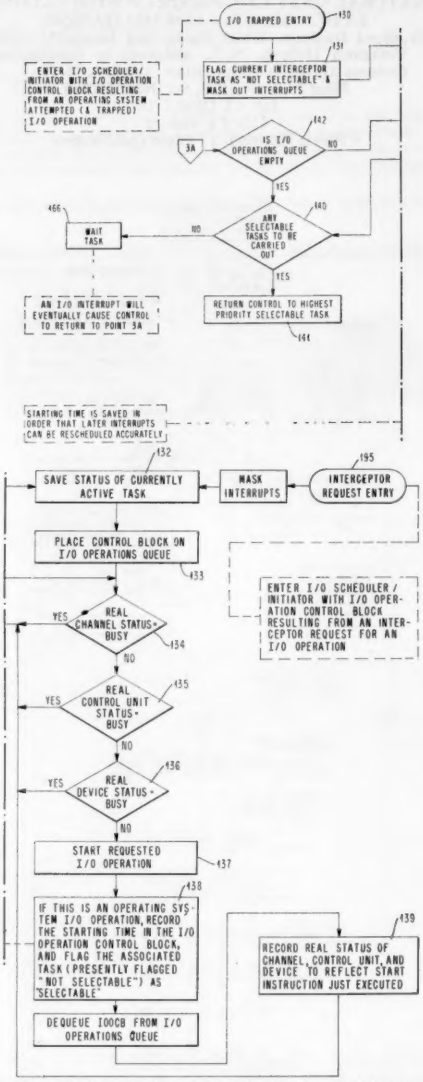
Continuation of application Ser. No. 218,743, Jan. 18, 1972. This application July 25, 1973, Ser. No. 382,431

Int. Cl. G06f *7/00*
U.S. Cl. 444—1

13 Sheets Drawing. 32 Pages Specification

To evaluate computer system performance, software techniques are frequently used to collect data on the system as it runs, and/or to simulate new devices. However, data collecting, simulating and report writing procedures degrade the performance of the system on which they are run and therefore provide distorted results. The technique herein is designed to hide the overhead procedure from the performance of the system by using prior art procedures in stopping the system clock whenever an overhead program is being executed, and adding to that a technique for compensating for distortion in the I/O area by intercepting and rescheduling I/O interrupts to compensate for the "stolen" time during which the system clock is stopped.

The procedure involves the interception of all I/O instructions issuing from the CPU to the channel and interception of all I/O interrupts from the channel in order to reschedule their presentation to the operating system. This is accomplished by measuring the length of time that it takes for the I/O operation to be performed and, by adding to that time any "stolen" time taken from the operating system during the period in which the I/O operation was outstanding, the presentation of the interrupt may be delayed an appropriate time. Provision is made for scheduling the interrupt in accordance with the above calculation, and provision is also made for further delaying the interrupt if additional time is taken between initial rescheduling and final presentation.


I/O TRAPPED ENTRY
130
ENTER I/O SCHEDULER/ INITIATOR WITH I/O OPERATION CONTROL BLOCK RESULTING FROM AN OPERATING SYSTEM ATTEMPTED (A TRAPPED) I/O OPERATION
FLAG CURRENT INTERCEPTOR TASK AS "NOT SELECTABLE" & MASK OUT INTERRUPTS
131
3A
IS I/O OPERATIONS QUEUE EMPTY
142
NO
YES
WAIT TASK
146
NO
ANY SELECTABLE TASKS TO BE CARRIED OUT
140
YES
AN I/O INTERRUPT WILL EVENTUALLY CAUSE CONTROL TO RETURN TO POINT 3A
RETURN CONTROL TO HIGHEST PRIORITY SELECTABLE TASK
141
STARTING TIME IS SAVED IN ORDER THAT LATER INTERRUPTS CAN BE RESCHEDULED ACCURATELY
132
SAVE STATUS OF CURRENTLY ACTIVE TASK
MASK INTERRUPTS
INTERCEPTOR REQUEST ENTRY
145
PLACE CONTROL BLOCK ON I/O OPERATIONS QUEUE
133
ENTER I/O SCHEDULER / INITIATOR WITH I/O OPERATION CONTROL BLOCK RESULTING FROM AN INTERCEPTOR REQUEST FOR AN I/O OPERATION
YES
REAL CHANNEL STATUS = BUSY
134
NO
YES
REAL CONTROL UNIT STATUS = BUSY
135
NO
YES
REAL DEVICE STATUS = BUSY
136
NO
START REQUESTED I/O OPERATION
137
IF THIS IS AN OPERATING SYSTEM I/O OPERATION, RECORD THE STARTING TIME IN THE I/O OPERATION CONTROL BLOCK, AND FLAG THE ASSOCIATED TASK (PRESENTLY FLAGGED "NOT SELECTABLE") AS "SELECTABLE"
138
RECORD REAL STATUS OF CHANNEL, CONTROL UNIT, AND DEVICE TO REFLECT START INSTRUCTION JUST EXECUTED
139
DEQUEUE IOOCB FROM I/O OPERATIONS QUEUE

REISSUES

JANUARY 22, 1974

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

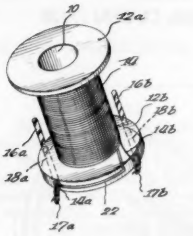
27,891
INDUCTOR COIL

Dhu Aine J. Davis, Wheaton, Ill., assignor to Hermetic Coil Co., Inc.

Original No. 3,544,940, dated Dec. 1, 1970, Ser. No. 792,721, Jan. 21, 1969. Application for reissue July 13, 1971, Ser. No. 162,127

Int. Cl. H01f *15/10*

U.S. Cl. 336—192 6 Claims



An electrical coil which has a bobbin configuration with a coil receiving central portion and a pair of end discs at the ends of the central portion defining a channel. A plurality of slots are formed in one of the end discs for receiving terminal leads which have exposed conductor portions for connection to end wires from a coil wound on the central portion of the bobbin. Each of the slots has openings at opposite ends so that a terminal lead may be inserted into one end of the slot with the exposed conductor portion protruding from the opposite end of the slot for connection to one of the coil end wires.

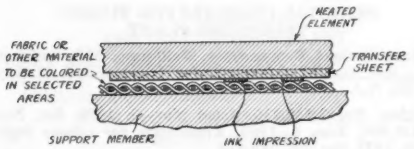
27,892
HEAT TRANSFER OF INDICIA CONTAINING SUBLIMABLE COLORING AGENT

Carl B. Blake, Bronx, N.Y., by Sinclair & Valentine Company, Inc., New York, N.Y., assignee

Original No. 3,363,577, dated Jan. 16, 1968, Ser. No. 532,490, Jan. 19, 1966, which is a continuation-in-part of Ser. No. 115,152, June 6, 1961. Application for reissue May 18, 1972, Ser. No. 235,380

Int. Cl. B41m *5/26*

U.S. Cl. 101—470 11 Claims



A process and structure for heat transfer of indicia from one surface to another involving the use of a transfer device consisting of a surface having imprinted thereon in mirror image the indicia to be transferred with an ink containing a sublimable dye.

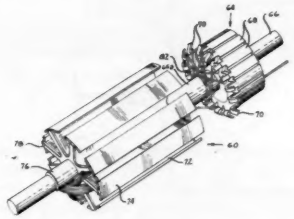
27,893
ARMATURE WINDING AND COMMUTATOR CONNECTION

Jerry E. Miller, Dayton, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio

Original No. 3,506,864, dated Apr. 14, 1970, Ser. No. 704,342, Feb. 9, 1968. Application for reissue Apr. 18, 1972, Ser. No. 245,282

Int. Cl. H02k *3/46*

U.S. Cl. 310—234 14 Claims



Novel winding patterns for armatures having various numbers of slots and either one or two coils per slot are disclosed along with methods and apparatus for winding armatures. Lead wires between coils are wrapped around the armature shaft and looped around commutator tangs. An efficient method of obtaining armatures having opposite polarities is also shown and described.

27,894
4-HYDROXY-3-(3-PHENYLUREIDO)CROTONIC ACID, GAMMA LACTONE COMPOUNDS

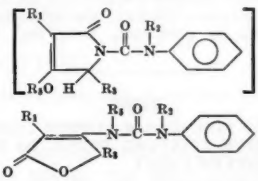
Peter Gerike, Hilden, Germany, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original No. 3,541,111, dated Nov. 17, 1970, Ser. No. 727,712, May 8, 1968. Application for reissue May 15, 1972, Ser. No. 253,639

Int. Cl. C07d *5/06*

U.S. Cl. 260—343.6 8 Claims

Novel compounds are presented which have the following structure



where:

R_1 is hydrogen, halogen, methyl or ethyl,

R_2 and R_3 are independently selected from hydrogen or alkyl of one through three carbon atoms and salts of said compounds when R_5 is hydrogen where the salt forming constituent is an alkali metal ion, alkaline earth metal ion, ammonium ion or mono-, di-, tri-, or tetra-substituted ammonium ion where the substituents are alkyl of one through four carbon atoms or benzyl, and

R_5 is hydrogen or alkyl of one through four carbon atoms.

These compounds are excellent defoliants.

27,895

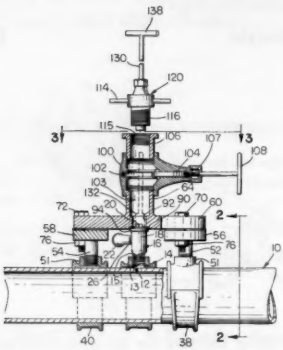
METHOD FOR REPAIRING PRESSURE LINES SUCH AS GAS MAINS AND THE LIKE

Charles W. Ray, Fort Wayne, Ind., assignor to Emmett O. Bandy, Indianapolis, Ind.

Original No. 3,626,576, dated Dec. 14, 1971, Ser. No. 807,846, Mar. 17, 1969. Application for reissue Jan. 26, 1973, Ser. No. 326,878

Int. Cl. F16l *55/10*

U.S. Cl. 137—15 **2 Claims**



In repairing gas mains, a fixture is clamped to the main at the location of the repair, and a conduit is then joined to the main through a sealed fit. The conduit has a valve which separates the conduit into two compartments, and the end of the conduit is adapted to receive a tool mounting, the valve being opened and a tool passed through the conduit to perform repair operations on the main. The tool mounting is connected to the conduit through a sealed connection, and the tool can be operated through the tool mounting means by an operator so that the repair operation occurs through a sealed conduit. The entire operation occurs with normal operation of the main under its usual operating condition of internal superatmospheric pressure.

This superatmospheric pressure can be varied and the present invention contemplates pressures for gas mains in the range of 60 p.s.i.–120 p.s.i., other pressures for other materials such as petroleum, water etc., varying as desired.

27,896

METHOD OF FORMING A COPPER CONTAINING PROTECTIVE COATING PRIOR TO ELECTRODEPOSITION OF PAINT

Werner Rausch, Stierstadt, Hans Hansen, Karben, and Gerhard Mueller, Hanau, Germany, assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Original No. 3,467,589, dated Sept. 16, 1969, Ser. No. 587,679, Oct. 19, 1966. Application for reissue Sept. 5, 1972, Ser. No. 286,505

Claims priority, application Germany, Nov. 6, 1965, P 12 87 413.4

Int. Cl. B01k *5/02*; **C23b** *13/00*

U.S. Cl. 204—181 **8 Claims**

1. A method for forming a protective coating on a ferrous metal surface which comprises contacting said surface with an acidic zinc phosphate coating solution containing from about 3 to 200 milligrams per liter of Cu^{++} for a period sufficient to form a zinc phosphate coating containing metallic copper on the surface and, thereafter, electrophoretically depositing a paint on the thus-coated surface.

27,897

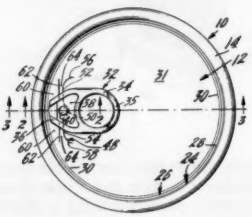
FULL OPEN END

Leonard Thomas La Croce, Paramus, and Raymond Luscombe Batchelar, Westwood, N.J., and John Wilson Rouse, Stamford, Conn., assignors to American Can Company, New York, N.Y.

Original No. 3,544,025, dated Dec. 1, 1970, Ser. No. 728,518, May 13, 1968. Application for reissue Aug. 5, 1971, Ser. No. 169,559

Int. Cl. B65d *17/20*

U.S. Cl. 220—54 **17 Claims**



A "self-opening" can end having a central wall is peripherally scored to define a removable panel which may be removed by manipulation of a pull tab which is riveted to the removable panel at a location adjacent to the peripheral score, the removable panel being provided with to ancillary score passing adjacent to the rivet on the side thereof away from the peripheral score, to set off in the removable panel a pivotable portion which contains the rivet and two flex-inducing scores which are disposed on either side of the rivet between the peripheral score and the ancillary score, to render the pivotable portion sufficiently flexible to prevent its rupture during the opening operation. The outer end of the pull tab is tilted upwardly to insure that the ancillary score ruptures before the peripheral score does.

27,898

PEDESTAL CLOSURES FOR BURIED TELEPHONE PLANT

Robert Garland Baumgartner, Baltimore, Md., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

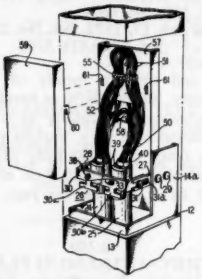
Original No. 3,538,236, dated Nov. 3, 1970, Ser. No. 831,086, June 6, 1969. Application for reissue Sept. 12, 1972, Ser. No. 288,412

Int. Cl. H02g *9/02*

U.S. Cl. 174—38 **3 Claims**

This specification discloses a pedestal-type telephone cable closure consisting of a base and an upper housing of like cross section. The base is mounted on a channel which is driven into the ground separately. The cables are led in through the base bottom and supported on a

bonding clamp that also contacts the cable's metallic shield. A center partition in the upper housing physically



segregates the pairs to which service wire splices will be made.

27,899

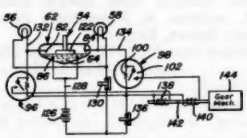
SLOPE SENSING DEVICE

Luther B. Burgin, Box 958, Poplar Bluff, Mo. 63901

Original No. 3,564,531, dated Feb. 16, 1971, Ser. No. 659,284, July 24, 1967, which is a continuation-in-part of abandoned Ser. No. 572,143, Aug. 12, 1966. Application for reissue Feb. 12, 1973, Ser. No. 331,581

Int. Cl. G08b *21/00*

U.S. Cl. 340—282 **17 Claims**



A body of mercury, the movement of which is dampened by baffles, establishes a conductive path between contacts within a chamber the position of whch reflects tilting of a grading blade [of] *to* automatically correct the position of the blade. The sensitivity of the device is varied by adjusting the position of an element partially submerged in the mercury.

27,900

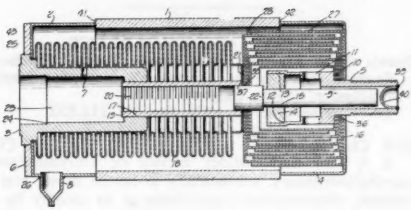
HERMETICALLY SEALED VARIABLE CAPACITOR WITH OPTIMUM MOVABLE PLATE SHAFT BEARING STRUCTURE

Joseph Emil Oeschger, Palo Alto, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Original No. 3,541,405, dated Nov. 17, 1970, Ser. No. 820,451, Apr. 30, 1969. Application for reissue Nov. 16, 1972, Ser. No. 307,163

Int. Cl. H01g *5/04*

U.S. Cl. 317—245 **5 Claims**



A variable vacuum capacitor having a ceramic body shell and metal end bells and a plurality of fixed concentric cylindrical plates mounted inside near one end of said body shell and a corresponding plurality of axially interleaving movable plates mounted on a shaft assembly. The shaft assembly is mounted through two thrust bearings; one of said bearings (internal) being located at a position within the axial length of the fixed plates, and the other (external) being mounted within the body shell between the plates and the opposite end of the body shell at a point where it supports one end of the shaft assembly and allows for shaft overtravel within the end bell at that end. The external bearing and its support are within a metal bellows open to the atmosphere at the same end. The metal bellows is attached (vacuum tight) near the center of the shaft assembly and compresses and extends axially with movement of the shaft assembly. The volume around the plates (including the internal bearing) is sealed and evacuated. An independent concentric hollow spindle fixed end mount supports the internal bearing and relieves the fixed plates of any structural load therefrom while also providing overtravel space for the internal end of the shaft assembly.

PLANT PATENTS

GRANTED JANUARY 22, 1974

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,443

CHRYSANTHEMUM PLANT

Barrie John Machin, East Broyle Estate, Chichester, England, assignor to Frampton's Nurseries Limited, Chichester, Sussex, England

Filed Dec. 27, 1971, Ser. No. 212,836

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey, substantially as shown and described. characterized particularly as to its novelty by the unique combination of a pure white color, an eight week response time under summer growing conditions, and a relatively large number of flowers per plant.

3,444

CHRYSANTHEMUM PLANT

Barrie John Machin, East Broyle Estate, Chichester, England, assignor to Frampton's Nurseries Limited, Chichester, Sussex, England

Filed Dec. 27, 1971, Ser. No. 212,835

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—82 **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey, pot type, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a uniform response under winter light conditions, a short internode length, incurved flowers, and a distinct ruby color.

3,445
CHRYSANTHEMUM PLANT
Barrie John Machin, East Broyle Estate, Chichester, England, assignor to Frampton's Nurseries Limited, Chichester, Sussex, England
Filed Dec. 27, 1971, Ser. No. 212,833
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a reduced flowering time, uniformity of response in a wide range of environmental conditions, and marigold orange color with red undertones.

3,446
CHRYSANTHEMUM PLANT
Barrie John Machin, East Broyle Estate, Chichester, England, assignor to Frampton's Nurseries Limited, Chichester, Sussex, England
Filed Dec. 27, 1971, Ser. No. 212,832
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of reduced flowering time, uniform response in a wide range of environmental conditions, and currant red color.

3,447
CHRYSANTHEMUM PLANT
Barrie John Machin, East Broyle Estate, Chichester, England, assignor to Frampton's Nurseries Limited, Chichester, Sussex, England
Filed Dec. 27, 1971, Ser. No. 212,831
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey, spray type, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a nine week flowering response during short days, a uniform habit of growth, and the ability to maintain the normal green color of its foliage under a wide variety of soil conditions.

3,448
GRAPEVINE
Luther R. Stohl, 5895 Avenue 426, Reedley, Calif. 93654
Filed Jan. 6, 1972, Ser. No. 215,922
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—47 **1 Claim**

A new and distinct variety of grapevine characterized principally by its leaves of an orbicular cordate configuration having five clefts dividing five lobes, large seedless berries having less rudimentary embryo and firmer pulp than the berries of the Thompson seedless grape which it most nearly resembles, but from which it is distinguished, growing in large loose clusters less compact and more elongated than the clusters of the Thompson seedless grape and supported by peduncles of a length of from 2 to 4 inches.

3,449
CHRYSANTHEMUM PLANT
Hubert Brandkamp, In der Flora 6, Anholt, Westphalia, Germany, and Hermann Vogel, Via delle Grugnole, Tre Cancelli, Nettuno, Italy
Filed Jan. 17, 1972, Ser. No. 218,369
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a wiry, upright plant with spider-flowers having from 60 to 80 fully expanded petals of tube-shape, which are blunt at their ends, an exact response time of 10 weeks over the year.

3,450
CHRYSANTHEMUM PLANT
Barrie John Machin, East Broyle Estate, Chichester, England, assignor to Frampton's Nurseries Limited, Chichester, Sussex, England
Filed Dec. 27, 1971, Ser. No. 212,838
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—80 **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey (pot type), substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a reduced response period, an increased number of flowers per plant, and improved quality of petal in poor winter light conditions.

3,451
CHRYSANTHEMUM PLANT
Barrie John Machin, East Broyle Estate, Chichester, England, assignor to Frampton's Nurseries Limited, Chichester, Sussex, England
Filed Dec. 27, 1971, Ser. No. 212,837
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—81 **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of purple color, short internode length, and uniform response time in poor winter light conditions.

3,452
ROSE PLANT
Marie-Louise Meilland, Cap d'Antibes, France, assignor to The Conrad-Pyle Company, West Grove, Pa.
Filed Jan. 10, 1972, Ser. No. 216,817
Claims priority, application France, Jan. 15, 1971, 7102259
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—20 **1 Claim**

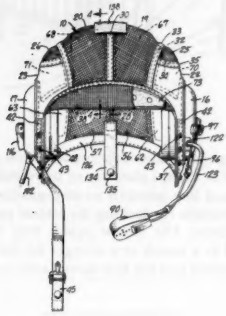
A rose plant of the hybrid tea class, with double red flowers, produced by crossing the variety Lovita (Plant Pat. No. 2,598), as pollen parent, on an unnamed seedling, as seed parent, which was the product of crossing Baccara (Plant Pat. No. 1,367) on Queen Elizabeth (Plant Pat. No. 1,257).

PATENTS

GRANTED JANUARY 22, 1974

GENERAL AND MECHANICAL

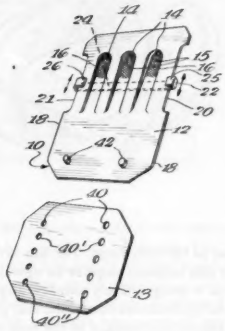
3,786,519
HEADGEAR STRUCTURE
Jackson Anthony Aileo, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.
Filed Nov. 12, 1970, Ser. No. 88,823
Int. Cl. A42b *3/00*
U.S. Cl. 2—6 **11 Claims**



A flexible helmet having plural inner and outer panels of woven fabric cut and assembled so as to conform closely to heads of different shapes and sizes, and plural pads for protecting the wearer's head against impacts, the pads being removably carried in separate pockets formed by the inner and outer panels. The pads may be fabricated of resilient energy-absorbing material and/or may include a layer of flexible ballistic material for protection against blows from sharp objects. The helmet panels may be made of open mesh fabric, and the pads may be perforated for ventilation of the helmet; also, the inner surfaces of the pads may be so shaped or lined as to provide ventilation spaces between the pads and the wearer's head. Sound-attenuating earcups are carried by the helmet in position for close-fitting engagement with the head. Size adjustment of the helmet is effected by means of a variable length nape strap at the rear of the helmet. In addition, the helmet may carry communications equipment, including earphones within the ear-cups, and a microphone, with a switch for the microphone sealed in a watertight enclosure within one of the earcups. An elongated flap extending across the lower inner margin of the rear of the helmet may be folded over and fastened to provide a passage for holding the wiring of the communications equipment. For further protection of the head, a rigid outer shell may be placed over and detachably secured to the flexible helmet, being stabilized in position relative thereto by means of cooperating, complementary pressure-actuable surface contact fastening elements respectively carried on the crown portions of the outer surface of the flexible helmet and the inner surface of the rigid shell.

3,786,520
SIMULATED POCKET ORNAMENT AND HOLDER
Jerome Z. Harmon, Box 591, Oak Lawn, Ill.
Filed Aug. 24, 1972, Ser. No. 283,538
Int. Cl. A41b *15/00*
U.S. Cl. 2—279 **5 Claims**

A combination decorative pocket ornament and adjustable holder therefor. The ornament is arranged in the shape of a folded handkerchief or scarf and is retained by the holder within a pocket of the wearer's clothing such that only the ornament is visible above the pocket. The holder includes gripping fingers and a slidable clamping bar to removably



retain the ornament thereon. An adapter member cooperates with the holder for raising or lowering the same within the pocket so that the device can be used for a variety of different pocket sizes.

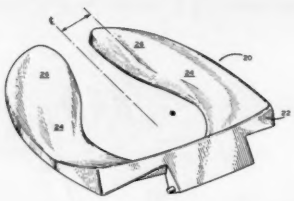
3,786,521
SWINGING BAFFLE ELEMENT FOR WATER TURBULENCE SUPPRESSION SYSTEMS
Mercer Donald Walket, Medina, Ohio, assignor to Adolph Kiefer McNeil Corporation, Akron, Ohio
Filed July 13, 1972, Ser. No. 271,360
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.15 **19 Claims**

A swimming pool turbulence reducing system employs a taut restraining cable positioned approximately at the water line to rotatably support a series of closely spaced baffle plates arranged in planes parallel with the axis of the cable, the mass and the surface areas of the plates being unequally distributed with respect to the rotatable axis so that the baffle plates tend normally to depend downwardly from the cable and will yieldingly swing from side to side in resisting wave movement.

3,786,522
TOILET SEAT
Alexander Kira, Ithaca, N.Y., and George R. Scheuring, Pittsburgh, Pa., assignors to American Standard Inc., New York, N.Y.
Filed Sept. 15, 1970, Ser. No. 72,466
Int. Cl. A47k *13/00*
U.S. Cl. 4—237 **13 Claims**

The defecation process can be substantially facilitated by means of a specially contoured toilet seat which is completely

adaptable to conventional toilets. The toilet seat has a hinge means for attachment to the toilet and an annular relatively planar section, conforming generally in peripheral configuration to the periphery of the bowl section of the toilet. The hinge post section positioned at the rear end of the toilet. The rear section of the toilet is upwardly and outwardly curved at a steep angle thereby preventing the user from sitting back on



the rear section of the toilet seat. The top surfaces of the seat in the rear and side sections slope in an upwardly and outward direction but at a progressively smaller angle than the rear most section. At the front section of the seat particularly in the thigh support region, the surface of the seat is somewhat concave and in a region of the front section the seat slopes in a direction which is the reverse of the slope at the side and rear sections.

3,786,523

MEDICAL APPLIANCE

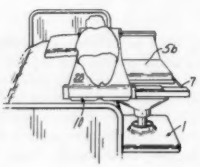
Georges J. F. Sele, rue Cdt. Marchand 23, Liege, Belgium

Filed Nov. 17, 1971, Ser. No. 199,664

Claims priority, application Belgium, Nov. 18, 1971, 759,132

Int. Cl. A61g *1/02, 7/02*

U.S. Cl. 5—81 B **6 Claims**



A stretcher including means which facilitates the transfer of a patient between a bed and the stretcher is disclosed. The stretcher includes actuators for controlling the vertical position of the appliance and also for imparting angular movement to transfer means which can be extended from the appliance. Additionally, the device may be provided with further actuators which are employed to convert the stretcher into a wheel chair by rotating back and foot support platforms relative to a central support member.

3,786,524

BEDS WITH LATERAL SLIDING PANELS

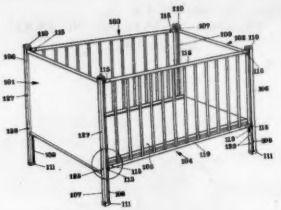
Marcel Mathou, 12 Gages, France

Filed Mar. 1, 1971, Ser. No. 119,778

Claims priority, application France, Feb. 27, 1970, 70.07142; Dec. 3, 1970, 70.43520

Int. Cl. A47d *9/00*

U.S. Cl. 5—100 **11 Claims**



A bed having head and foot panels with lateral panels therebetween. The lateral panels may be raised or lowered to a high position, a low position or any position in between. Provision is also made for locking the lateral panels in the top or bottom positions. The lateral panels may be removed to convert the bed to a bench or a stringer on the bottom of the bed may be removed and the bed turned over to convert it to a playpen.

3,786,525

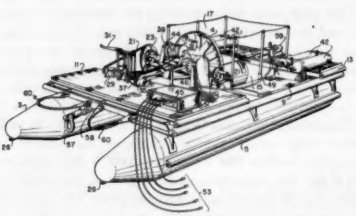
TRANSPORTABLE MOORING BUOY ASSEMBLY

John A. Christians, Springfield, Va., and Francis M. Cevasco, Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 1, 1972, Ser. No. 258,691

Int. Cl. B63b *21/52, 21/28*

U.S. Cl. 9—8 R **12 Claims**



A readily transportable offshore mooring buoy assembly is disclosed. The mooring buoy comprises a floating platform mounted on a pair of pontoons. The platform houses an explosive embedment anchor assembly and the apparatus required to put the anchor in place in order to anchor the mooring buoy. Prior to anchoring the mooring buoy, the anchor assembly is housed on the mooring buoy in approximately a horizontal position. The apparatus used to place the anchor assembly in a vertical position and to lower the anchor into the water is air controlled. The air supply is carried on the mooring buoy. The anchor embedding operation can be carried on remotely from a boat used to tow the mooring buoy in place. The mooring buoy and boat are both of such size that they can be readily transported to the location where the mooring buoy is to be anchored.

3,786,526

SWIMMING-AID DEVICES

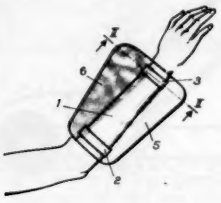
Claude C. A. Ausseil, Square Curie, Saint Malo, France

Filed Mar. 17, 1972, Ser. No. 235,639

Claims priority, application France, Mar. 23, 1971, 7110667

Int. Cl. A63b 31/04

U.S. Cl. 9—307 5 Claims



This invention relates to a device for assisting swimming or for re-education for use in swimming pools, which is fastended to a limb, and formed of two fins disposed longitudinally with respect to the limb and extending radially with respect thereto.

3,786,527

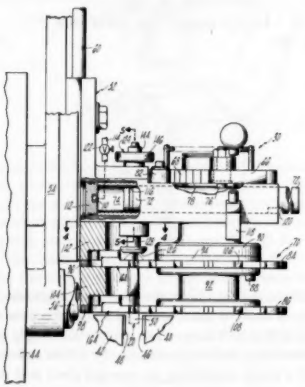
POINTER FOR MULTIPLE SIZE WORK BLANKS

Robert D. Morton, West Hartford, and Edward G. Grohoski, Litchfield, both of Conn., assignors to The Hartford Special Machinery Company, Simsbury, Conn.

Filed Aug. 5, 1971, Ser. No. 169,207

Int. Cl. B21k 27/00; B23g 9/00, 11/00

U.S. Cl. 10—169 11 Claims



A machine having a frame and a modular stack of interchangeable rotary dials mounted on the frame for carrying headed work blanks of varying shank length and diameter, fluid actuated head and shank pusher assemblies effecting compressive engagement of the work blanks against the dials when each work blank is positioned in power operated die means for a pointing operation, and a fluid circuit including adjustable air spring means providing a continuous fluid bias for actuating the head pusher and shank pusher assemblies.

3,786,528

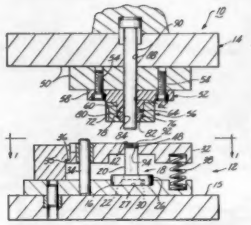
APPARATUS AND METHOD FOR MANUFACTURING WELD NUTS

Jack Sol, 28539 Trvistock Trl., Southfield, Mich.

Filed Oct. 24, 1972, Ser. No. 299,742

Int. Cl. B21d 53/24; B21j 5/12

U.S. Cl. 10—76 R 8 Claims



An apparatus for manufacturing a weld nut by the application of pressure to a standard nut blank. The apparatus has reciprocally mounted and axially aligned upper and lower die members between which an axial pressure is applied to the nut blank to form the weld nut. A cutting die carried by and movable with one of die members has a central aperture through which the other die member and nut blank pass during the pressure-applying stroke. The aperture is so sized with respect to the nut blank that the same, during lateral and axial deformation thereof, becomes snuggly disposed within the upper portion of the aperture and is retained therein during the separation of the upper and lower die members. A knockout pin carried by the movable die member engages the upper surface of the deformed nut blank to eject the same through the cutting die aperture and remove all lateral deformations such that the resulting weld nut has overall dimensions which are substantially the same as the original dimensions of the nut blank. A method for fabricating the weld nut is also disclosed.

3,786,529

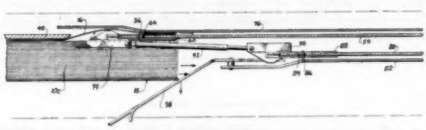
BOOKBINDING MACHINE WITH ENDLEAF FOLDING MEANS

Jack Bendror, Sands Point, and Gastone Venco, Huntington, both of N.Y., assignors to Roblins and Bendron Associates Inc., Nassau, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,547

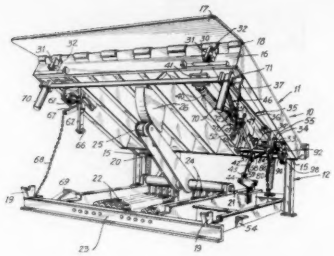
Int. Cl. B42c 15/00

U.S. Cl. 11—1 R 16 Claims



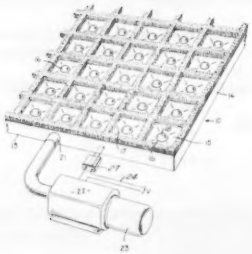
Bookbinding machine which embodies means for folding the outer leaves of end leaf assemblies which are attached to the sides of the spine of a book. The folds are formed by placing a backing plate with a relatively low frictional coefficient behind each outer leaf, then sliding the outer leaf on said backing plate in the direction of the spine of the book to form a loop, pressing the loop to form a fold, and adhesively securing the fold to that portion of the leaf assembly which is attached to the side of the spine of the book.

3,786,530
DOCK LEVELER
Robert L. Le Clear, Albion, Mich., assignor to T & S Equipment Company, Albion, Mich.
Filed June 24, 1971, Ser. No. 156,396
Int. Cl. B65g 1/00
U.S. Cl. 14—71 16 Claims



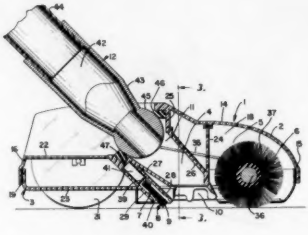
A swingable deck having a pivoted end lip, means for extending the lip, means for holding the lip extended, means for releasing the lip from its extended condition, and means for returning the deck to its initial position.

3,786,531
PORTABLE SELF-CLEANING DOOR MAT
John P. Borg, 271 St. Johns Rd., Toronto, Ontario, Canada
Filed July 7, 1972, Ser. No. 269,825
Int. Cl. A47l 5/38
U.S. Cl. 15—310 3 Claims



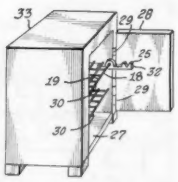
A self-cleaning door mat having a hollow mat frame which is provided with a top plate of substantially rigid material. The plate is formed with a plurality of depressed apertures which are preferably aligned axially and transversely. The marginal crests of the depressions are covered with felt or other soft material which will remove dirt from shoes, etc. The apertures are closed by spring mounted valve members which protrude above the depressions a sufficient distance to be unseated by being depressed by a person's foot being wiped off on the soft material or by a person standing thereon. The dirt is sucked down through the apertures by a suction device which device automatically starts when stepped-on. The suction device is connected to a collector into which the dirt is deposited.

3,786,532
CARPET SWEEPER
Edward W. Lindsay, Ponca City, Okla., assignor to Vacu-Maid, Inc., Ponca City, Okla.
Filed June 19, 1972, Ser. No. 263,961
Int. Cl. A47l 9/04, 9/06
U.S. Cl. 15—364 6 Claims



A carpet sweeper for use with a source of vacuum includes a housing having cooperating wall portions defining an air flow passage therethrough with an entrance adjacent a floor and extending transversely of a path of movement of the sweeper. The housing has a brush chamber adjacent the air flow passage entrance with a rotary brush mounted therein and operative to move dirt toward said entrance. An elongated brush is arranged adjacent said entrance on the opposite side from said rotary brush. The air flow passage has a member connected to a source of vacuum to effect movement of air upperwardly through the flow passage.

3,786,533
DOOR AND A WINDOW CHECK
Thomas P. O'Donnell, 220 Highland Blvd., Brooklyn, N.Y.
Continuation-in-part of Ser. No. 472,398, July 6, 1965, abandoned, and a continuation-in-part of Ser. No. 311,067, Sept. 24, 1963, abandoned. This application May 6, 1970, Ser. No. 35,222
Int. Cl. E05c 17/54; E05f 5/02
U.S. Cl. 16—82 9 Claims

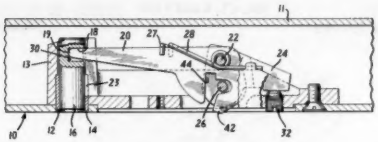


A manually actuable check member for checkwisely holding a door in a desired open position wherein a said check is pivotably attached to a support so as to abbuttingly engage a surface of the door, said support may be either a door frame, or, a link of a chain straddling an opened door and its frame, or, a rod of a shelf contained within a container closeable by its door.

3,786,534
CENTER-TOP DOOR PIVOT MOUNTING MECHANISM
Paul R. Ferguson, 340 Industrial Ave., Cheshire, Conn.
Filed Nov. 15, 1971, Ser. No. 198,625
Int. Cl. E05d 7/10
U.S. Cl. 16—176 9 Claims

A mechanism for control of the operation of top frame pivots for center mounting doors wherein there is provided an

upper frame member with a vertical pivot pin movable in a sleeve serving as a dowel to aid in positioning and securing the mechanism. One end of a lever extends into a lateral recess in the pivot pin, and the lever is mounted on a transverse shaft



for oscillation through a central area and for reciprocation between a position in which the lever engages a vertical pin wall to prevent movement through said central area and a position in which it may be moved through the central area.

3,786,535

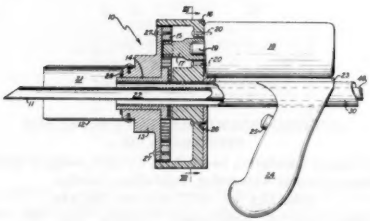
APPARATUS FOR EVISCERATING POULTRY AND THE LIKE

Joseph A. La Barber, 501 Pebble Beach Dr., Kern City, Calif.

Filed June 23, 1972, Ser. No. 265,953

Int. Cl. A22b *3/08*

U.S. Cl. 17—11 R **9 Claims**



A dressing tool includes a rotatable cutting means with an elongated probe member coaxially disposed therein. The probe member extends outwardly beyond the cutting means. The alimentary canal is cleaned by drawing a vacuum through the elongated probe which is to be inserted into the anus of the poultry. The anus is then drawn away from the body of the poultry by drawing a vacuum in the space between the probe and the cutting means. Another feature of this invention is directed to the use of a control mechanism to provide the necessary sequence of operations so that the dressing tool will operate automatically under assembly line conditions.

3,786,536

MEANS FOR CUTTING AND TENDERIZING MEATS

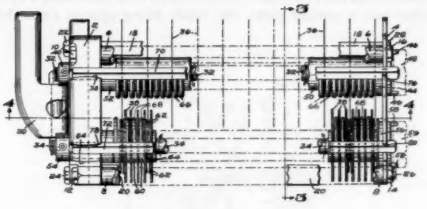
Robert Deckert, Acton, Mass., assignor to Sir Steak Machinery, Inc., Boxborough, Mass.

Filed May 8, 1972, Ser. No. 251,076

Int. Cl. A22c *9/00*

U.S. Cl. 17—25 **17 Claims**

A machine which simultaneously cuts a slab of meat into strips through the use of a first group of rotating spaced disc cutters mounted on a first rotating shaft and simultaneously the meat is penetrated by a second group of rotating radially extending penetrating blades mounted on a second rotating shaft. The peripheral speed of the disc cutters is always greater



than the peripheral speed of the penetrating blades. Means compelling passage of the disc cutters completely through the meat is an essential feature.

3,786,537

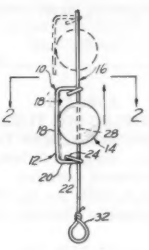
GRIPPER FOR ELONGATED MEMBERS

Harold E. Schenavar, 18696 Inkster, Detroit, Mich., and Irving L. Pierce, 760 Trombley, Grosse Point Park, Mich.

Filed Aug. 11, 1972, Ser. No. 279,979

Int. Cl. A01k *91/04*; **F16g** *1/04*

U.S. Cl. 24—134 R **2 Claims**



Disposed approximately perpendicular to the opposite ends of an elongated bridge portion are two approximately parallel hook arms having reversely-bent ends providing Vee-notches into which the elongated member to be gripped is wedged by a jam element approximately midway between the arms and of slightly greater width than the length of the arms whereby to urge the bridge portion away from the elongated member and consequently to wedge the elongated member into the Vee-notches. In FIGS. 1 and 2 the jam element is a bead or block threaded onto the elongated member, for example, a resilient wire. In FIGS. 3 and 4 the jam element is a cam portion on the end of a handle pivotally mounted on the bridge portion for engagement with the elongated member, for example a rod or pipe, held in the hook arms.

3,786,538

TEXTILE CRIMPING

Peter Hutchinson, Ilkley, and Geoffrey Darnbrough, Wetherby, both of England, assignors to T.W.S. Nominee, Company Limited, London, England

Filed Mar. 9, 1972, Ser. No. 233,221

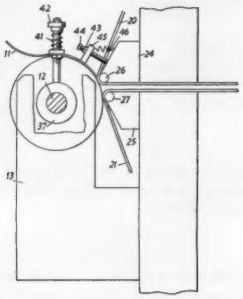
Claims priority, application Great Britain, Mar. 16, 1971, 7,007/71

Int. Cl. D02g *1/12*

U.S. Cl. 28—1.6 **13 Claims**

An improved crimper for wool and other fibres employs a feed section and a conveyor or delivering section in which the fibre layer advances at a slower speed than in the feed section,

the two sections being separated by a folding zone sufficiently small to ensure that the layer is folded therein into simple folds or waves of amplitude dependent upon the spacing of the conveyor surfaces. The improved feed section is constituted by a roller and a curved plate, the latter being spaced from the

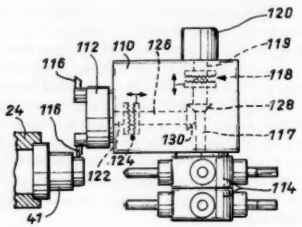


roller at its intake end and conforming closely to the roller nearer the folding zone. The roller and/or the plate may be resiliently biased towards the operating position, for example by being mounted on a resiliently biased, pivoted arm. Provision may be made for applying steam to the fibres in the folding zone.

3,786,539
MULTIPLE TOOL TURRET

Gerhard Foll, Esslingen, and Heinrich Lahm, Esslingen-Sirnau, both of Germany, assignors to Index-Werke KG Hahn & Tessky, Esslinger/Neckar, Germany

Filed Oct. 9, 1970, Ser. No. 79,483
Claims priority, application Germany, Oct. 16, 1969, P 19 52 050.4
Int. Cl. B23b 7/04
U.S. Cl. 29—27 **5 Claims**

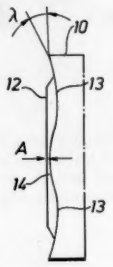


A turning machine with a rotary work spindle and a slide having a lower carriage movable at right angles to the spindle axis, an upper carriage movable on the lower carriage in parallelism with the axis of the spindle, and a tool support on the upper carriage. The tool support constitutes a vertically reciprocable carriage with several longitudinally extending rows for tool holders, or it may consist of at least one indexible turret with axially parallel and/or radially extending sockets for tool holders. If the tool support consists of several turrets, its turrets are either coaxial or indexible about axes which make an angel of 90 degrees with each other. Each tool turret can have two or more annuli of sockets for tool holders.

3,786,540
CUTTING INSERT

Evert Gustav Lundgren, Sandviken, Sweden, assignor to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden

Filed Oct. 17, 1972, Ser. No. 298,234
Claims priority, application Sweden, Oct. 27, 1971, 13607/71
Int. Cl. B26d 1/00
U.S. Cl. 29—95 **7 Claims**

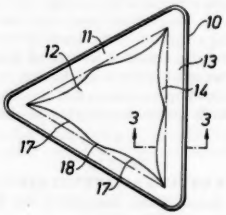


A cutting insert for use in the chip-forming machining of a metal work piece has at least one insert corner with one or more associated cutting edges provided with chip-breakers in the form of grooves in the broad sides of the cutting insert. According to the invention, the cutting edge is so formed that in the plane of the clearance or side face it describes a curve consisting of inward- or downward- directed parts from the insert corners and an interjacent outward- or upward turned part.

3,786,541
CUTTING INSERTS HAVING TWO-STAGE CHIPBREAKER

Evert Gustav Lundgren, Sandviken, Sweden, assignor to Sandvikens Jernveks Aktiebolag, Sandviken, Sweden

Filed Oct. 18, 1972, Ser. No. 299,336
Claims priority, application Sweden, Oct. 27, 1971, 13605/71
Int. Cl. B26d 1/00
U.S. Cl. 29—95 R **6 Claims**



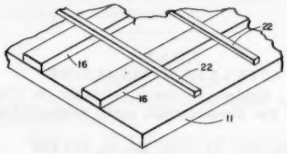
The invention relates to a cutting insert having chip-breakers in two stages, and is characterized in that the cutting edge and the associated chip-breaker describe a curve composed of straight and/or arched parts in the plane of the clearance- or side face.

3,786,542

METHOD OF FORMING CIRCUIT STRUCTURES BY PHOTO ETCHING-ELECTROFORMING PROCESS

Jacques Francois Linder, Palos Verdes Peninsula, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Nov. 18, 1971, Ser. No. 200,016
Int. Cl. H01j 9/00
U.S. Cl. 29—25.17 2 Claims



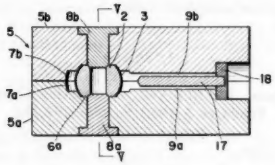
A mandrel or mold shaped in a desired configuration is formed by photoprocessing a film of photopolymer applied to a substrate. A metallic structure is formed in the mold by electroforming. The photopolymer forming the mold is then dissolved away leaving the desired metallic configuration.

3,786,543

METHOD OF PRODUCING ROTATING JOINT MEMBER BY CASTING

Shigeru Sato, Yokohama, Japan, assignor to Nippon Miniature Bearing Co. Ltd., Nagano and Tanaka Diecast Co. Ltd., Yokohama, Japan

Filed Apr. 26, 1972, Ser. No. 247,712
Int. Cl. B23p 11/00, 17/00
U.S. Cl. 29—149.5 B 5 Claims



A spherical element whose external peripheral surface is coated with a thin heat resisting resin film and said spherical element is set into the inside of a metal mold provided with a molding chamber for casting a socket for embracing the spherical element, and then a molten metal is poured into the metal mold for forming the socket and is solidified to cast the socket that embraces the spherical element and this cast socket is removed from the metal mold and the heat resisting resin film remaining on the external peripheral surface of the spherical element is removed mechanically or chemically thereby forming a clearance that permits the free rotation of the spherical element with respect to the socket in the external peripheral surface of the spherical element and the inner surface of the socket.

3,786,544

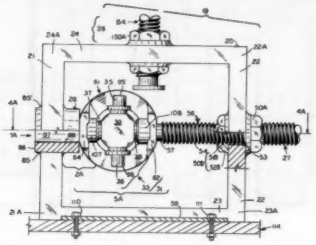
PROCESS AND APPARATUS FOR UNIVERSAL JOINT DISASSEMBLY AND ASSEMBLY

Willie Douglas Ferguson, Borger, Tex., assignor to Scott E. Neil, Jr., Salida, Colo.

Filed Apr. 12, 1971, Ser. No. 132,967
Int. Cl. B23p 19/02
U.S. Cl. 29—251 4 Claims

An adjustable press with vibratile characteristics and a symmetrical frame structure locates a compression means along the longitudinal axis of each of a plurality of symmetrical bearing sleeves and resilient lock rings. The sleeves are positioned with a press fit in a support therefor in a U-joint casing and, in operative position, held in place by the lock rings.

The press is operated to apply vibration as well as a shearing force to each of such resilient lock rings to separate each of



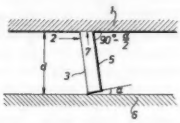
such sleeves from the U-joint casing. The press also supports a symmetrically located second compression means for moving and locating longitudinally spaced apart bearing sleeves in longitudinally spaced apart supports therefor with a press fit.

3,786,545

MILLING CUTTER

Sven Axel Olof Wirfelt, Sandviken, Sweden, assignor to Sandvik Akitebolag, Sandviken, Sweden

Filed Nov. 20, 1972, Ser. No. 307,765
Claims priority, application Sweden, Nov. 29, 1971, 015234
Int. Cl. B26d 1/12
U.S. Cl. 29—105 R 4 Claims



In a milling cutter comprising a cutter body having a plurality of cutting insert-receiving recesses spaced about its periphery and cutting inserts removably secured in said recesses by clamping means, each insert having two opposite, substantially plane, end surfaces with side surfaces between them, the improvement wherein the side edges of each cutting insert are formed with clearance angles s equal to one-half that clearance angle a which is necessary for the functioning of the milling cutter. Each insert is positioned, in its recess, with one side edge resting against a support surface that is planetarily ground in the cutter body substantially parallel to its rotational plane so that the angle which one end surface presents to said planetarily ground support surface is equal to $90° - (\alpha/2)$.

3,786,546

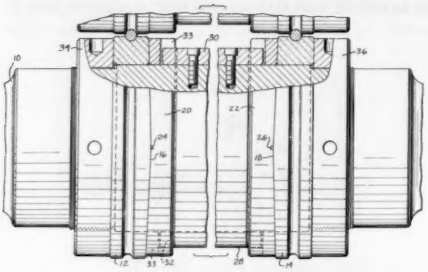
FORMING ROLL, ESPECIALLY FOR ROD MILLS AND THE LIKE

Thomas A. Brown, Greensburg, and Joseph B. Huber, Acme, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Oct. 2, 1972, Ser. No. 294,194
Int. Cl. B21b 31/08
U.S. Cl. 29—125 13 Claims

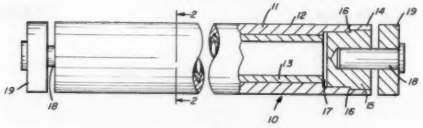
A forming roll of hard material, such as cemented tungsten carbide, is mounted on a driving shaft. The shaft has a shoulder either integral with the shaft or in the form of a nut threaded thereon abutting one axial end of the roll while the

other end of the roll is in the form of a wide angle "V." A keying element is mounted on the shaft having a wide angle "V"



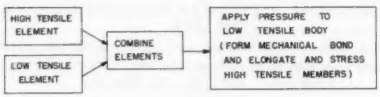
configuration complementary to that of the roll, and this last mentioned element is keyed to the shaft for transmitting torque from the shaft to the roll.

3,786,547
COATING ROLLER
Robert J. O'Connor, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 22, 1971, Ser. No. 200,910
Int. Cl. B21b *31/08*
U.S. Cl. 29—130 **3 Claims**



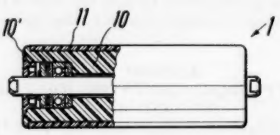
An improved coating roller, particularly for use in coating photographic compositions onto webs, including a tubular generally-cylindrical roller member and a tubular generally-cylindrical insert shrink-fitted into the roller member, such that the interference interface between the members dampens vibrations imparted to the roller. Prior to insertion the OD of the insert is approximately equal to the ID of the roller member within a tolerance of ± 0.001 inches. The insert extends axially within the outer member so that at least fifty percent of the inner surface of the roller member is frictionally engaged by the outer surface of the insert.

3,786,548
METHOD OF MAKING PRESTRESSED BEAMS
Robert E. Haskell, 1232 S. Lake Stickney Dr., Lynnwood, Wash.
Filed June 8, 1972, Ser. No. 260,970
Int. Cl. B23p *17/00*; **B21d** *39/00*
U.S. Cl. 29—155 R **7 Claims**


HIGH TENSILE ELEMENT
LOW TENSILE ELEMENT
COMBINE ELEMENTS
APPLY PRESSURE TO LOW TENSILE BODY (FORM MECHANICAL BOND AND ELONGATE AND STRESS HIGH TENSILE MEMBERS)

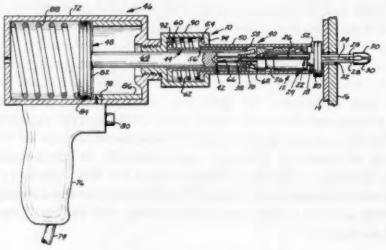
A method of manufacturing a prestressed bimetallic beam including the steps of imbedding a high tensile element within a low tensile element and then mechanically welding the two elements by applying pressure to the low tensile members as a unit. This mechanical interlock and elongation places the high tensile member under stress which is uniform throughout the entire length of the low tensile encapsulating element. The result of such manufacturing technique is a bimetallic beam or the like which has the structural advantage of great strength and low weight. The high tensile elements are placed where necessary for each particular design including the expected stress and the low tensile element is then easily and economically machined or formed into the final desired exterior configuration.

3,786,549
ARTICLE OF MANUFACTURE
Richard Pott, Heiden, Germany, assignor to Precismeca Gesellschaft Fur Fordertechnik mbH, Sulzbach-Saar, Germany
Filed Nov. 11, 1971, Ser. No. 197,806
Claims priority, application Germany, Nov. 12, 1970, G 70 41 835.8
Int. Cl. B21b *13/02*
U.S. Cl. 29—116 R **8 Claims**



A roller for use in conveyors has a roller body composed of a core part and an outer part which surrounds the core part. Either both parts or at least the outer part is composed of cellular synthetic plastic material which may be of the rigid type or of the elastically yieldable type.

3,786,550
FASTENER APPLYING TOOL
Sterling B. Jones, 858 Duff Ave., West Covina, Calif.
Filed Oct. 5, 1972, Ser. No. 295,282
Int. Cl. B21j *15/42*
U.S. Cl. 29—238 **17 Claims**



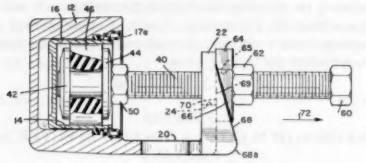
The tool of this invention is specifically adapted to apply a novel clamping device or temporary fastener which includes a body having an enlarged head end to engage the near side of work to be clamped, a tension member axially movable in the body and having a gripper head at its forward end to engage the remote side of the work and an aft end projecting from the aft end of the body to be engaged by a puller, and a locking actuator axially movable forward on the body to lock the tension member in clamping position. The tool includes a first barrel to surround the fastener body and engage the head end to push it against the work, a second barrel slidable in the first

barrel to move the actuator, and a puller slidable in the second barrel to retract the tension member. The forward end of the puller has a gripping jaw to engage the tension member. A first reaction member in the form of a cylinder pushes solidly against the second barrel which pushes yieldingly through a spring against the first barrel. A second reaction member in the form of a piston retracts the puller under fluid pressure. The force applied first retracts the puller until a predetermined clamping load is achieved, and then forces the second barrel forward with respect to the first barrel to contact the actuator and lock the clamping device.

3,786,551
PISTON PULLER

Jack C. Gregg, 1518 Glenview Dr., and Samuel L. Davis, R.R. No. 3, both of Elwood, Ind.

Filed Apr. 10, 1972, Ser. No. 242,635
Int. Cl. B23p *19/04*
U.S. Cl. 29—266 **6 Claims**

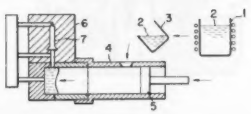


Apparatus for use in removing and reinstalling pistons in disc brake assemblies of the type including a caliper housing providing a bore in which the piston is reciprocably disposed, the bore being open at one end and closed at its opposite end, and the piston being hollow with a closed end adjacent the closed end of the bore and an open end adjacent the open end of the bore. Such caliper housings also provide an outboard shoe support bracket spaced axially apart from the open end of the bore. The apparatus comprises a threaded shaft which extends through an opening in the said support bracket to have one of its ends received in the hollow of the piston. A rubber-like grommet is disposed on that one end of the threaded shaft between a fixed abutment and a movable abutment. A nut is advanced against the movable abutment to compress axially the grommet to cause it to expand radially frictionally to engage the piston. Another nut and an adapter plate are advanced against the axially outer side of the support bracket to pull the piston and against the axially inner side of the support bracket to push the piston inwardly.

3,786,552
METHOD OF MANUFACTURING A COMPOSITE BIMETALLIC SLEEVE FOR A DIE-CASTING MACHINE

Yuichi Saito, Urawa; Tokuzo Shikano, Oomiya, and Masanori Kimura, Saitama-ken, all of Japan, assignors to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha, Chiyoda-ku, Tokyo-to, Japan

Filed June 27, 1972, Ser. No. 266,749
Claims priority, application Japan, June 30, 1971, 46/47289
Int. Cl. B22f *3/24*
U.S. Cl. 29—420.5 **3 Claims**

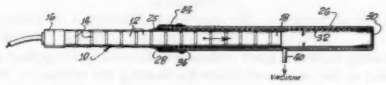


A sleeve is composed of a relatively thin inner layer made of such highly infusible material as molybdenum, tungsten or their alloys, and an outer layer made of an iron-base alloy. For manufacture, a mixture of powders compounded to form an iron-base alloy when heated is compacted to cylindrical shape around a hollow cylinder suitably molded of one of the listed metals and alloys. The compact is then sintered to provide an outer layer of the iron-base alloy solidly united with the hollow cylinder.

3,786,553
METHOD OF ASSEMBLING TRANSDUCER ACOUSTICALLY COUPLED BY SILICONE GREASE

Lawrence K. C. Ma, Honolulu, Hawaii, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1972, Ser. No. 309,579
Int. Cl. B29d *17/00*
U.S. Cl. 29—169.5 **6 Claims**

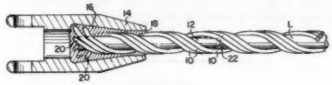


A transducer which includes an element assembly which is acoustically coupled to a boot by silicone grease, such as dimethyl polysiloxane oil and silicone oxide. A method of assembling the transducer may comprise coating an elongated element assembly with the silicone grease; inserting an elongated resilient boot into an evacuating tube which is open at one end and closed at an opposite end; drawing a vacuum inside the tube at a position intermediate its ends for expanding the boot tightly against the inner surface of the tube; inserting the coated element assembly into the expanded boot; wiping the silicone grease smooth on the element assembly as the assembly is inserted into the tube; releasing the vacuum inside the tube; and withdrawing the assembly and boot from the tube.

3,786,554
METHOD OF FABRICATING A FIELD-APPLIED GRIPPING DEVICE

Jess C. Little, Chagrin Falls, Ohio, assignor to A. B. Chance Company, Centralia, Mo.

Division of Ser. No. 729,618, May 16, 1968, Pat. No. 3,551,960. This application Aug. 17, 1970, Ser. No. 64,615
Int. Cl. B23p *25/00*
U.S. Cl. 29—461 **5 Claims**



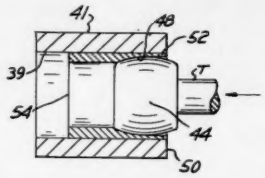
A field applied dead end and method of making same wherein a plurality of preformed helical rods, or wires are secured at one end thereof preferably by encapsulating material within a socket housing. The other ends project from the socket and are disposed to wrappingly engage and thereby grip a line. A core member projects from the socket and is surrounded by the helically formed rods to provide a stop against which the end of the line being gripped abuts.

3,786,555

APPLICATION OF BEARING MATERIAL

John M. Robertson, Northville, Mich., and Wilbur E. Wyatt, Greesburg, Ind., assignors to Gulf & Western Metals Forming Company, Southfield, Mich.

Filed Aug. 25, 1971, Ser. No. 174,885
Int. Cl. B21d *39/04*
U.S. Cl. 29—474.3 1 Claim



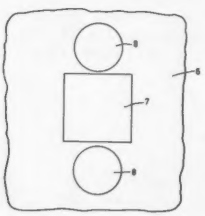
Bearing material, such as an aluminum alloy, is applied and bonded to the support surface by heating the surface to 500° to 700° Fahrenheit, applying the bearing material in sheet form to the surface at one edge thereof, and spreading the material across the surface by moving a zone of pressure application to the bearing material from one edge of the surface to an opposed edge so as to reduce the thickness of the bearing material and to provide a flow which continually brings fresh previously unexposed bearing material from the interior of the sheet so as to effect a molecular bond. Typical applications are to sleeve type bearings or bushings, and a preferred use of the invention is the application of bearing material to connecting rods.

3,786,556

MOUNTING SEMICONDUCTOR BODIES

Alan David Weston, Southampton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1971, Ser. No. 206,620
Claims priority, application Great Britain, Dec. 15, 1970, 59,436/70
Int. Cl. B23k *31/02*
U.S. Cl. 29—473.1 7 Claims



Method of securing a semiconductor body to a support surface comprising steps of placing semiconductor body face in contact with surface with at least one solder body on the surface and spaced laterally from the semiconductor body, melting solder to cause it to flow by capillary action between the body face and support surface, and cooling solder to provide intermediate layer between the surface and the body face. Also, a product made by this method.

3,786,557

FABRICATION OF THIN FILM RESISTORS

George E. Bodway, 23200 Mora Glen Dr., Los Altos, Calif.

Division of Ser. No. 56,610, July 20, 1970, abandoned. This application May 22, 1972, Ser. No. 255,888
Int. Cl. H01c *7/00*
U.S. Cl. 29—620 1 Claim

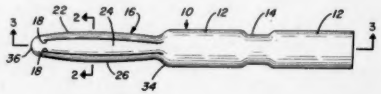
A method of fabricating thin film resistors is disclosed including the step of trimming the resistors to their final values by heating a resistance layer from which all the resistors are formed for a predetermined time to ensure that each resistance value will fall within a range appropriate to that resistor. The time of heating is determined by first separately determining the heating time required to bring each individual resistor within its appropriate range. A time period which overlaps at least a portion of each individual time period is then selected as the heating time.

3,786,558

METHOD OF MAKING A HOLLOW ELECTRICAL CONTACT

Lauris J. McCarthy, 99 N. Hermosa, Sierra Madre, Calif.

Continuation-in-part of Ser. No. 52,546, July 6, 1970, abandoned. This application Nov. 16, 1971, Ser. No. 199,383
Int. Cl. H01r *11/00*
U.S. Cl. 29—630 A 3 Claims



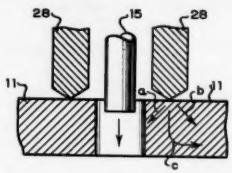
A releasable, hollow electrical connector formed from an elongated hollow body of resilient and flexible metal, an elongated section of which is provided with a plurality of elongated slots having width of less than .010 inch, which slots are formed by spark erosion of the metal.

3,786,559

COLD DIFFUSION WELDS IN A MICROCIRCUIT PACKAGE ASSEMBLY

James M. Smith, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 145,457, May 20, 1971. This application May 22, 1972, Ser. No. 255,859
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 6 Claims



A hermetically sealed package for microcircuits is provided with a base plate on which one or more microcircuits are

mounted by, for example, soldering them thereto or by means of studs, the studs being positioned in the base plate so as to accommodate the microcircuits which are held down on the plate, for example, by spring fasteners mounted on the studs. The microcircuits may be mounted on a heat conductive carrier base. Electrical feedthroughs by hermetically sealed in the base plate. In certain forms of the package, an isolation wall structure is employed to electrically isolate one microcircuit from another, the wall being secured to the base plate via studs and stud fasteners. The studs and feedthroughs are attached and hermetically sealed to the base plate by inserting them into holes in the base plate while simultaneously forcing the holes to shrink in size, thereby forming a diffusion weld between the studs (and feedthroughs) and the base plate. A cover, which is thin compared to the base plate, is attached and hermetically sealed to the base plate over the microcircuits, carrier, isolation wall and feedthroughs. This is accomplished by employing a tool with an inclined surface to form a diffusion weld between the cover and the base plate.

3,786,560

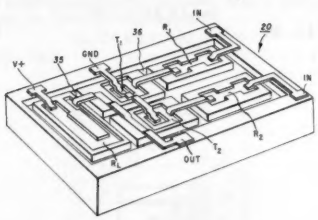
ELECTRICAL ISOLATION OF CIRCUIT COMPONENTS OF INTEGRATED CIRCUITS

James A. Cunningham, 8434 Gladwood Ln., Richardson, Tex.

Continuation of Ser. No. 468,196, June 30, 1965, abandoned. This application Mar. 20, 1972, Ser. No. 236,011

Int. Cl. B01j *17/00*

U.S. Cl. 29—577 **5 Claims**



A method of fabricating an integrated circuit having interconnected circuit components adjacent one surface of a semiconductor body having its opposite surface disposed upon an insulating layer on a substrate wherein the semiconductor material between the circuit elements is removed to form a moat or channel between the circuit elements and electrically isolate them from one another by the space remaining after the removal and the insulating layer.

3,786,561

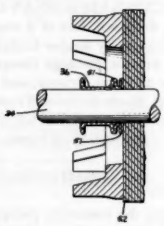
METHOD FOR USE IN MANUFACTURING DYNAMOELECTRIC MACHINE

Vincent V. Busian, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 40,224, May 25, 1970, Pat. No. 3,681,836. This application Dec. 23, 1971, Ser. No. 211,575

Int. Cl. H02k *15/02, 15/10*

U.S. Cl. 29—598 **9 Claims**



Rotatable assembly of dynamoelectric machine is provided with at least one spacer that is collapsed from an initial length, in its free form, to a preselected length in its final configuration, to provide means for controlling end play of the assembly and for establishing a desired alignment of the assembly with the stationary structure of the machine. Collapsing the spacer reduces an internal diameter of the spacer and rigidly secures the spacer to a shaft portion of the assembly. Method includes reducing the axial length of a thrust member to a preselected length relative to a reference portion of a rotatable assembly and may also include reducing the length of a second thrust member to establish a preselected distance between two thrust surfaces. Apparatus includes a pair of opposed rams having spacer collapsing tooling that includes anvil means for collapsing the spacers and abutment means for engaging other portions of a rotatable assembly. A lost motion mechanism interconnects one of the anvil means and one of the abutment means.

3,786,562

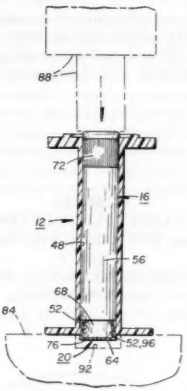
METHOD OF FABRICATING A BOBBIN AND CORE ASSEMBLY

Raymond S. Ciszewski, Lagrange, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 18, 1972, Ser. No. 316,196

Int. Cl. H01f *7/06*

U.S. Cl. 29—602 **4 Claims**



A disc of a nonmagnetic malleable material is forced within a center tubular portion of a nonmagnetic bobbin with an elongated cylindrical core of a magnetic material. The diameter of the disc is greater than the inside diameter of the tubular portion, the core is adapted to be closely received longitudinally within the tubular portion, and as the disc is forced within the restricted opening of the tubular portion by the core it is folded around the end of the core and secured thereto. Continued movement of the core, with the disc secured to the end thereof, through the tubular portion and slightly past the end thereof forms the bobbin and core assembly.

3,786,563

SHAVING SYSTEM

Francis W. Dorion, Jr., Hingham; Warren I. Nissen, Topsfield, both of Mass., and Edward E. Pomfret, Berkshire, England, assignors to The Gillette Company, Boston, Mass.

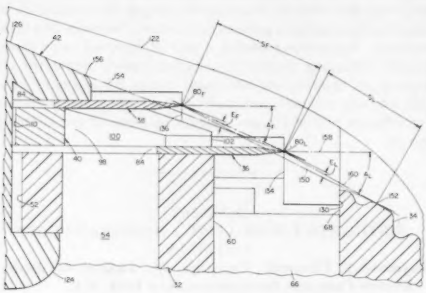
Filed Aug. 31, 1971, Ser. No. 176,547

Int. Cl. B26b *21/06*

U.S. Cl. 30—50 **2 Claims**

A shaving system comprises a leading blade member having a cutting edge and a following blade member having a cutting

edge. The cutting edges are supported in spaced parallel relation to one another by structure which extends along substantially the entire lengths of the leading and following blade members and a guard structure is disposed forwardly of the leading cutting edge. The guard structure is disposed relative



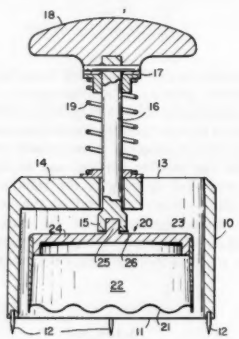
to the leading cutting edge to define a leading edge tangent angle in the range of 20°–32° and a span (S_L) in the range of 0.030–0.080 inch, the following cutting edge is rearwardly offset from the leading cutting edge to define a span (S_F) in the range of 0.030–0.080 inch, and each cutting edge has an exposure in the range of from −0.002 inch to +0.004 inch.

3,786,564

CARPET PLUG CUTTER

Melvin G. Acheson, 4555 Auburn Ave., Suite A, Sacramento, Calif.

Filed Oct. 19, 1972, Ser. No. 298,839
Int. Cl. B26b *3/08*
U.S. Cl. 30—124 **10 Claims**



A tool for cutting circular plugs of carpeting solely by rotary cutting action and without the use of impact forces is disclosed. Cutter blade assemblies for use in such tool providing serrated cutting edges with various types of serrations are described. Means for quickly and easily interchanging cutter blade assemblies of various diameters in the tool are disclosed.

3,786,565

PROCESS FOR MANUFACTURING FALSE TEETH

Maurice Louis Jarrault, Fresnes, France, assignor to Societe Civile d'Etudes Et De Recherches Pour L'Application De La Ceramique Dentaire en abreviation S.E.R.A.C., Paris, France

Filed Mar. 6, 1972, Ser. No. 232,230
Int. Cl. A61c *13/00*
U.S. Cl. 32—8 **8 Claims**

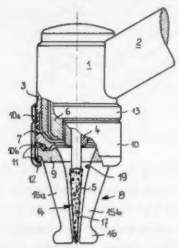
A process for manufacturing false teeth constituted of a metallic frame made of non-precious metal, for example, chromium-nickel or cobalt-chromium, this frame being coated with various layers of dental porcelain having a medium melting-point, this process being note-worthy for there is laid down on the frame which is in the form of a cap, fine particles of metallic brazing of cobalt-chromium so as to form on the outer face of the frame, positive retentions, then, a physico-chemical binder, burnt under vacuum, is applied on the said frame, afterwards, porcelain layers are laid down and burnt as usual.

3,786,566

DENTAL DRILL HANDGRIP

Dusan Jelicic, Gatterstrasse 8, Gallen, Switzerland, and Ivan Jelicic, Milosa Docerca 21, Belgrad, Yugoslavia

Filed Nov. 10, 1972, Ser. No. 306,030
Claims priority, application Yugoslavia, Nov. 12, 1971, 2863
Int. Cl. A61c *1/16*
U.S. Cl. 32—29 **14 Claims**



A dental drill handle or handgrip comprising a drivable clamping mechanism for a rotating tool, the clamping mechanism being rotatably mounted in a housing. A protective shield partially surrounds the rotating tool at least along its effective or working portion while leaving free a region of engagement or attack. The protective shield is freely rotatable or pivotable about a portion of the periphery of the tool.

3,786,567

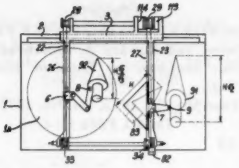
APPARATUS FOR DRAWING THE ISOMETRIC PERSPECTIVE VIEW OF AN OBJECT

Jean Louis Dangay, deceased, late of 4 rue Alfred de Musset, Hauts de Seine, France; by Regine Godard, 23 rue de l'Annonciation, Paris, France; Philippe Dangay, 79-81 avenue P. Brossolette, Hauts de Seine, France, and Catherine Dangay, 74 rue Gabriel Peri, Hauts de Seine, France (heirs)

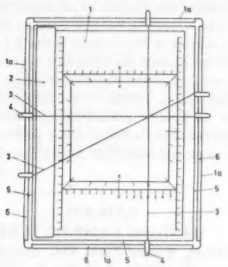
Filed June 30, 1972, Ser. No. 268,124
Claims priority, application France, June 30, 1971, 7123910
Int. Cl. B43l *13/14*
U.S. Cl. 33—23 B **10 Claims**

Apparatus enabling the isometric perspective of an object to be drawn from flat views of the object, including a fixed support on which the flat views of the object are provided, a rotatable support for a drawing sheet and positionable in one

of three positions spaced by 120°, a follower for following a flat view, a tracer displacable over the rotatable support and means linking the follower and tracer such that displacements of the follower in two perpendicular directions cause displacements of the tracer which are perpendicular but in the ratio of one over the square root of three, the linkage means for displacements in one reference direction comprising rotary means, the effective diameters if which are in the ratio of one over the square root of three.

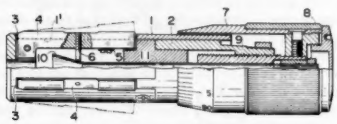


3,786,568
GEOMETRY APPARATUS
Erich Schulte, Hagener Str. 25, Nachrodt, and Ulrich Hebel, Helenenweg 7, Kirchen, both of Germany
Filed May 1, 1972, Ser. No. 249,028
Claims priority, application Germany, May 3, 1971, G 71 16 996.5; June 21, 1971, G 71 27 928.6
Int. Cl. B43l *5/02, 13/14*
U.S. Cl. 33—76 R **11 Claims**



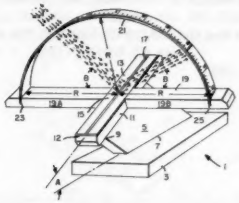
Apparatus for mathematical-geometric experimentation with variable straight lines, distances, angles, and areas in one plane.

3,786,569
THREE-POINT INSIDE TAPER-MEASURING INSTRUMENT
Minero Yamauchi, Kawasaki, Japan, assignor to Yehan Numata, Yokohama City, Japan
Filed Nov. 22, 1971, Ser. No. 200,756
Int. Cl. G01b *5/24*
U.S. Cl. 33—174 E **1 Claim**



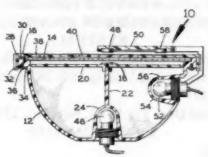
This invention relates to an instrument for measuring the degree of an internal taper and comprises a cone having an inclined surface which increases in diameter from its inner to its outer end and is moved axially within a tubular sleeve by an actuating screw. Three identical longitudinal measuring members are pivotally attached to said tubular sleeve at their forward ends and supported resiliently at their rearward ends. Adjustable abutment members projecting inwardly of said measuring members contact the surface of said cone.

3,786,570
SUNDIAL
Robert H. Davies, 3831 Carson Cir., Palo Alto, Calif.
Filed July 31, 1972, Ser. No. 276,519
Int. Cl. G04b *49/00*
U.S. Cl. 33—270 **10 Claims**



An improved sundial comprising a reflective surface member supported in a plane parallel with the earth's axis and adapted to receive and reflect sun rays; a non-reflective line inscribed along said reflective surface parallel to the axis of the earth's rotation and adapted to project a shadow; a translucent semicylindrical member projected over said surface and co-axial about said line, the surface of said cylinder carrying a time scale observable from the exterior of the translucent member such that the shadow is highlighted by a bright sunlit outline of reflected sun rays with said shadow indicating the time of day.

3,786,571
AUDIO COMPASS
Lloyd Sol Kelman, 2452 S.W. 30th Ave., Fort Lauderdale, Fla.
Filed Aug. 30, 1972, Ser. No. 284,904
Int. Cl. G01c *17/26*
U.S. Cl. 33—363 K **8 Claims**



The audio compass includes a first polarized transparent sheet affixed to a magnetic needle of a magnetic compass, and second and third polarized transparent sheets affixed to a graduated compass ring rotatably mounted on a housing for the magnetic compass and having their planes of polarization offset from each other by an angle which is bisected by the polarization plane of magnitude first sheet when the zero mark of the compass ring is set at north. Light from a first light source shines through the first and second sheets on a first photocell, and light from a second light source shines through the first and third sheets on to a second photocell. Circuit means coupled to the photocells produces first and second audio tones of different frequencies interrupted at rates related to the intensity of the light received by the first and

second photocells respectively. A shift of the second and third sheets to the left or right from the north position increases the light received by one of the photocells and decreases the light received by the other photocell to produce a tone which is interrupted at a rate related to the change of the light received by one of the photocells. Thus, when the audio compass is mounted in a boat and the compass is set for a particular heading, a deviation of the boat to the left of that heading will produce a tone of one frequency, and a deviation of the boat to the right of that heading will produce another tone of a different frequency. The rate of the interruptions or modulations in the tones indicates the magntidue of the deviation.

3,786,572

GAUGE FOR USE IN STRAIGHTENING AUTOMOTIVE FRAMES

Byron A. Larson, 116 La Crosse Ave., South San Francisco, Calif.

Filed Oct. 19, 1972, Ser. No. 299,022
Int. Cl. G01b *11/26*
U.S. Cl. 33—288 **4 Claims**

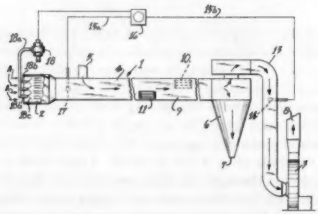
A gauge for use in straightening automotive frames wherein an elongated bar is provided with a series of spaced holes in each end section thereof, with pairs of holes in the opposite end sections being located equal distances from the midpoint of the bar. A pair of rigid hangers have their lower end swingably anchored in selected holes in the bar, and each hanger has a hook at its upper end arranged to engage with openings in an automotive frame that is to be straightened. Moreover, a vertical sight pin is located at the midpoint of the bar. When the automotive frame has been straightened, the vertical sight pins on several gauges will coincide with the longitudinal centerline of the chassis frame, thus testing horizontal displacement of the frame members. In event that all bars of the several gauges are disposed in the same horizontal plane, there is no displacement vertically of the frame members.

3,786,573

METHOD OF AND A DEVICE FOR CONTROLLING THE PROCESS TEMPERATURE IN AN AIR STREAM DRYING SYSTEM

John J. Scheppe, Washington, Pa., and Raymond N. Carini, North Brunswick, N.J., assignors to Helme Products, Inc., Helmetta, N.J.

Filed Dec. 27, 1971, Ser. No. 211,873
Int. Cl. F26b *3/10*
U.S. Cl. 34—10 **7 Claims**



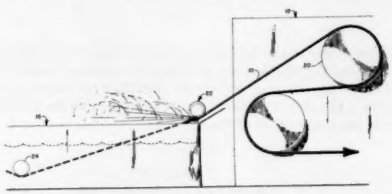
A method of maintaining a high intake temperature and a low outlet temperature in a gas stream conveying suspended particles to be dried including the step of introducing a controlled amount of ambient cooler into an intermediate portion of the drying gas stream. The device comprises preferably two ambient air intake openings provided with controllable louvers.

3,786,574

METHOD FOR REMOVING WATER FROM TOW

Donald L. Finley, and Edward A. Morehead, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.J.

Filed May 26, 1972, Ser. No. 257,406
Int. Cl. F26b *5/14*
U.S. Cl. 34—23 **5 Claims**



In a process for treating continuous length filamentary tow of man-made fiber that is moved through a heated water bath, drafted and then in due course of processing is subsequently moved into a heatsetting chamber where it is heatset, the improved method of removing water from the tow by guiding the tow immediately from the heated water bath to and displacing it under and around the surface of an improved dewatering jet device and partly wrapping the tow around that portion of the dewatering jet device within which is the jet opening through which air is blown against the wrapped around portion toward the upstream portion of the tow and through the tow. The improved dewatering jet device is a cylindrical body member provided with an axially extending slot-like opening having substantially parallel walls and a depth to width ratio of about 5:1 and a radius on the outer lips of the opening of about 1/32 inch.

3,786,575

HANGING LAMP FIXTURE

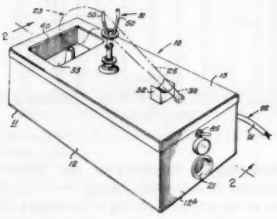
Edward L. Riblett, Winter Park, Fla., assignor to William S. Carson; James F. Hafele; Roderick T. Wilson; William W. Gluyas, Jr. and John H. Day, part interest to each

Filed June 27, 1972, Ser. No. 266,575
Int. Cl. A45d *20/24*; F26b *19/00*
U.S. Cl. 34—99 **8 Claims**

A hanging lamp fixture having a concealed hair dryer therein is provided. The fixture is hung to the ceiling of a room

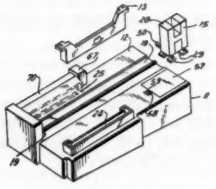
to provide light in the room and may be converted to a hair dryer by moving the light sources to one side and lowering the fixture to the proper height over a chair.

3,786,576
PIPE DRYER AND ODORIZER
John R. Gavlick, Sr., 780 Emberwood, Dallas, Tex.
Filed May 17, 1972, Ser. No. 254,168
Int. Cl. F26b *25/00*
U.S. Cl. 34—104 **6 Claims**



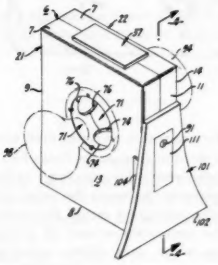
A device for drying and odorizing smoking pipes including a housing, a pipe support on the housing, an air flow nozzle extending from the housing to direct air into an inverted pipe bowl in the support, a blower in the housing to direct air into the drying nozzle, an electrical resistance heater for heating air directed from the blower to the nozzle, and a wick for odorizing air drawn into the housing by the blower.

3,786,577
EDUCATIONAL TOY
Sidney Tepper, Millburn, and Thomas J. Fauls, West Orange, both of N.J., assignors to Educational Toys Inc.
Filed Feb. 2, 1972, Ser. No. 222,834
Int. Cl. G09b *1/14*
U.S. Cl. 35—35 D **14 Claims**



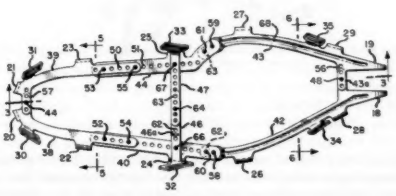
A spelling toy wherein movable structures carrying letters of the alphabet are caused to move by gravity down an inclined path to predetermined positions on a housing. The housing includes a plurality of slots, and an orifice for guiding any one of a plurality of verifying means or actuators into the housing. In addition, the housing pivotally supports a plurality of levers, each of said levers being capable of passing through one of the slots when operated by an actuator. Each actuator corresponds to a word to be spelled and includes a plurality of unequaly spaced abutments for engaging some of the plurality of levers. Each of the movable structures includes projections which extend over some of the plurality of the slots when the structures are at the predetermined positions. As a result, when the letters associated with the structures at the predetermined positions spell out a word associated with an actuator, and that actuator is depressed into the orifice, the activated levers pass through their respective slots without engaging the projections of the structures. The actuator does, however, engage a lever which causes a lid on the housing to open, thereby permitting a doll to pop up. Alternatively, if a word is not spelled out, the actuator causes the levers to knock over the structures of the letters which are out of place. The projections of the falling structures engage a member which in turn drives a link into the path of the lid lever, thereby preventing movement of the lid lever and preventing the lid from opening. As a result, the doll does not pop up.

3,786,578
DISPLAY MOUNT FOR LOCKS
Thomas P. Hufford, Foster City, and Hollis L. De Vines, Pacifica, both of Calif., assignors to Schlage Lock Company
Filed Nov. 24, 1972, Ser. No. 309,206
Int. Cl. G09b *25/00*
U.S. Cl. 35—49 **7 Claims**



A display mount is provided for any of several locks each having an actuator assembly and a bolt assembly, the bolt assemblies having different backsets or faceplate arrangements or both. The mount holds any one of the different locks assembled for operation and in appropriate position in the mount. The display mount is in complementary, detachable parts and may be supported on a table or wall.

3,786,579
ADJUSTABLE CRAMPONS
James R. Clark, and Larry R. Gearheard, both of Bellevue, Wash., assignors to Seattle Manufacturing Corporation, Bellevue, Wash.
Filed Jan. 29, 1973, Ser. No. 327,465
Int. Cl. A43b *3/10*
U.S. Cl. 36—7.6 **12 Claims**



An adjustable crampon with a frame which is articulated for width adjustment and has extensible rear frame members for length adjustment, and is made rigid after being fitted to a given boot.

3,786,580

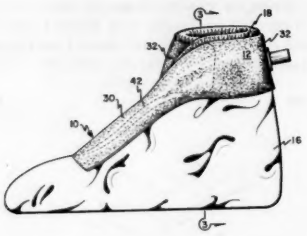
INNER BOOT AND METHOD FOR FORMING THE SAME

Melvin W. Dalebout, Salt Lake City, Utah, assignor to Tanner, Gold & Trask and Kipp and Christian

Continuation-in-part of Ser. No. 8,547, Feb. 4, 1970, Pat. No. 3,581,412, which is a continuation-in-part of Ser. No. 726,094, May 2, 1968, Pat. No. 3,521,385. This application Dec. 1, 1970, Ser. No. 93,964

Int. Cl. A43b *00/00*

U.S. Cl. 36—2.5 AL 27 Claims



An inner boot for use within an outer shell which includes a flexible inner liner sized to receive the foot of an individual, an outer liner positioned about the inner liner to form a substantially closed compartment between the liners and attached to the inner liner with connecting means for maintaining filling material within the compartment and for passing gas out of said compartment when said filling material is injected thereinto. A filling tube can be provided in communication with the compartment for injecting a resin elastomer reaction mixture into said compartment.

3,786,581

SKI BOOT

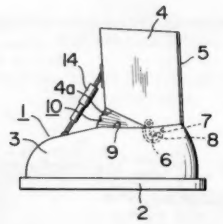
Tetsuya Mochizuki, Tokyo, Japan, assignor to Hope Kabushiki Kaisha, Tokyo-to, Japan

Filed Feb. 26, 1973, Ser. No. 335,815

Claims priority, application Japan, Feb. 29, 1972, 47-24778

Int. Cl. A43b *7/06*

U.S. Cl. 36—2.5 AL 3 Claims



A ski boot made of a rigid material comprises a boot proper and a shaft pivotably connected to the boot proper and having its lower front portion cut off to enable it to tilt in a forward direction. An air bladder is provided in the cut off portion of the shaft and a pipe connected to the air bladder communicates the air bladder with the inside of the boot proper. A forward lean motion of the skier during skiing is utilized for compressing the air bladder and thereby providing ventilation inside the ski boot.

3,786,582

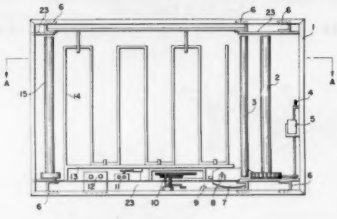
ILLUMINATED PICTORIAL DISPLAY MECHANISM

Istvan Ralbowsky, 1265 Blvd. d'Auteuil, Laval, Quebec, Canada

Filed Sept. 20, 1971, Ser. No. 181,688

Int. Cl. G09f *11/29*

U.S. Cl. 40—31 3 Claims



In illuminated display mechanisms the automation has heretofore consisted of automatic off-on switches controlling the illumination or sequential lighting of patterns of light bulbs or tubes which greatly restricts the number of displays which may be presented on a single surface. In this invention back or front illumination may be provided for a great number of pictures, signs or messages; the number being limited only by the duration of each display, the interval of time between each and the allowable size of the body of the mechanisms which may have one or several display faces depending on their size and shape. The pictures, signs or messages to be displayed are printed or painted full size on a band of translucent flexible material of suitable size which moves between two reversible terminal rolls appropriately located within the mechanism and to which the ends of the band are connected. Idler guide rollers are placed at each point at which a direction change of the translucent material occurs. During the change of displays the internal illumination is interrupted so that the actual change is not visible externally. The automatic driving mechanism, timing sequences, illumination control and movement reversal are all electrically operated and controlled and may be activated by self-contained built-in units or by remote control. This invention increases the number of displays available from each display unit, decreases the display change time and permits multifaced units with a minimum of mechanical or electrical addition or variation.

3,786,583

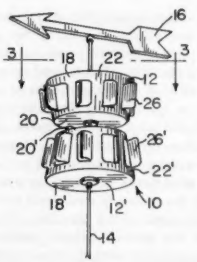
AIR MOTION APPARATUS

Arthur L. Revor, 3433 W. 117th St., Merrionette Park, Ill.

Filed May 18, 1972, Ser. No. 254,564

Int. Cl. G09f *11/02*

U.S. Cl. 40—39 2 Claims



An air motion apparatus particularly adapted to move in response to air currents in a fascinating and eye-appealing

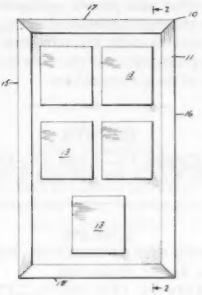
manner, having a body means formed from a generally frustoconical container mounted on a spindle means for rotation about the central axis thereof. The body means has formed in or attached to its peripheral side surface a series of elongated vane means which may be slightly curved in transverse cross section and which serve to catch air currents due to wind motion or heat and thereby impart a rotation to the body means about the central axis of the spindle. A plurality of body means mounted on a spindle means, the vane means of each adjacent body means being pitched in opposite directions so that adjacent body means will rotate in opposite directions about the spindle.

3,786,584

PHOTO DISPLAY FRAME AND ATTACHMENT MEANS THEREFOR

Sheldon Holson, Norwalk, Conn., assignor to The Holson Company, Wilton, Conn.

Filed Jan. 22, 1973, Ser. No. 325,849
Int. Cl. G09f 1/10
U.S. Cl. 40—124 **2 Claims**



A display frame for temporarily exhibiting photographic prints and similar planar display material by magnetic attachment. The frame includes a planar backing member of metallic material, and the display material is affixed thereto by means of spots of planar synthetic resinous material having magnetized metallic particles therein which are magnetically attracted to the backing member, and are temporarily affixed to a rear surface of the print or display material by a coated adhesive substance having relatively limited adhesive properties relative to hard calendered paper, so as to be readily peelable therefrom for reuse with other display material.

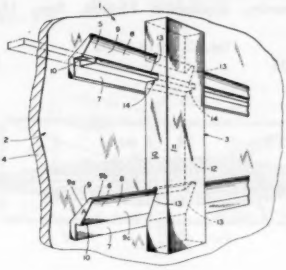
3,786,585

DISPLAY SIGN STRUCTURE

Gary Delaquila, Addison, and John R. Bercier, Elk Grove Village, both of Ill., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 19, 1971, Ser. No. 144,795
Int. Cl. G09f 7/00
U.S. Cl. 40—125 H **6 Claims**

A sign arrangement including a sign support structure having upper and lower outwardly extending sign support arms each having an outer diagonally upwardly extending tapered end bar portion and a sign having complementary upper and lower inwardly and upwardly extending tapered bar receiving slots received in the tapered end portions and lock means in the form of key slots in the lower base portion of the upper bar receiving slots and a key lock member inserted in the key lock



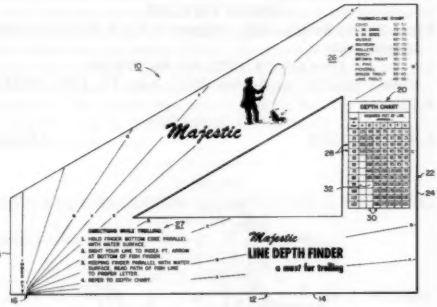
slots and abutting against the lower edge of the upper arm in preventing removal of the sign from the sign support structure.

3,786,586

METHOD AND ARTICLE FOR DETERMINING HOW MUCH LINE TO USE WHEN TROLLING

Edward J. Swan, Ontario, N.Y., assignor to Majestic Lures, Ontario, N.Y.

Filed Jan. 11, 1973, Ser. No. 322,895
Int. Cl. A01k 97/00
U.S. Cl. 43—4 **15 Claims**



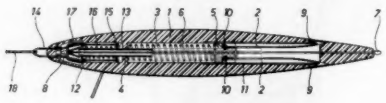
The depth at which fish are located is first measured using, for example, a sonar depth finder. The line depth finder of this invention is a plastic plate in the form of a truncated right triangle which is held vertically with its horizontal reference line horizontal, and the slope of the fish line while trolling is compared to a plurality of differently sloped and marked lines on the line depth finder. After selecting the sloped line that most closely matches the actual slope of the fish line, reference is made to a depth chart located directly on the line depth finder. The depth chart plots "depth in feet" against the various sloped lines and gives the length of line required to position the hook at that depth while trolling. The line depth finder has the same information printed on both sides, and all of the sloped lines preferably emanate from a single index point.

3,786,587

TROLLING LURE

Eino Ilmari Niileksela, Kruunukoankatu 1 B19, Helsinki, Finland

Filed Nov. 17, 1971, Ser. No. 199,409
Claims priority, application Finland, Nov. 18, 1970, 3101/70
Int. Cl. A01k 85/02
U.S. Cl. 43—35 3 Claims



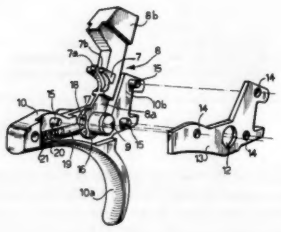
A trolling lure is disclosed having a pair of hooks hidden in the body of the lure. A special triggering mechanism is disposed in a chamber of the lure body and comprises a setting rod held in the set position by a pair of U-shaped safety springs under the combined effects of a setting spring and the resilient kneed arms of a forked spring attached to the fishing line, the arms passing through the bights of the safety springs and connected to the setting spring which is under compressive stress. The hooks are propelled from the lure under the action of a discharge spring which is released when the bights of the safety springs are separated due to the action of tightening the fishing line. The hooks are tensionally disposed within the interior of the lure body and fixed to a piston bearing on the discharge spring, so that when the discharge spring is released the piston moves longitudinally within the interior of the lure body and causes the hooks to be propelled from the lure.

3,786,588

ARRANGEMENT FOR PRE-SELECTING THE SEQUENCE OF FIRING OF A DOUBLE-BARRELLED GUN HAVING A SINGLE TRIGGER

Renzo Soana, Brescia, Italy, assignor to S.p.A. Luigi Franchi, Brescia, Italy

Filed July 28, 1972, Ser. No. 275,992
Claims priority, application Italy, Aug. 13, 1971, 69721 A/71
Int. Cl. F41c 19/00
U.S. Cl. 42—42 R 1 Claim



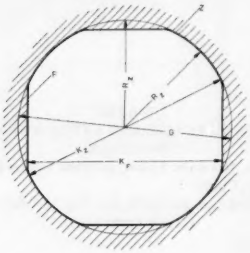
An arrangement for pre-selecting the firing sequence of a double-barrelled gun, in which a pivoted selector arm resiliently connected to a single trigger is displaceable parallel to its pivot axis between two positions in which it is positively located for cooperation with one or the other of two hammer release catches for discharging a selected one of the barrels first upon pulling the trigger when both hammers are cocked, according to the position in which the said pivoted arm is located.

3,786,589

BARRELS FOR RIFLES AND PISTOLS WITH RUNNING LANDS AND GROOVES

Hans-Joachim Kaltmann, Dusseldorf, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed June 15, 1971, Ser. No. 153,207
Claims priority, application Germany, June 18, 1970, 2029877
Int. Cl. F41c 21/00; F41f 17/10
U.S. Cl. 42—78 3 Claims



A barrel for rifles and pistols equipped with lands and grooves, wherein the greatest measure of the groove caliber of the barrel corresponds with the minimum measure of the diameter of the projectile, and the land caliber amounts to about 96 percent of the groove caliber.

ERRATA

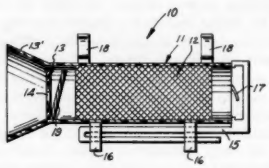
For Classes 43—4 and 43—35 see:
Patents Nos. 3,786,586 and 3,786,587

3,786,590

FISHING ROD RETRIEVING DEVICE

Closter G. Weeks, Box 54, Qulin, Mo.

Filed May 30, 1972, Ser. No. 257,948
Int. Cl. A01k 87/00
U.S. Cl. 43—25 4 Claims



A device for attachment to a fishing rod in order that it will automatically float to the surface if lost overboard. This device consists primarily of a cylinder with clamp means for the rod and having a self-contained balloon with chemical means within the cylinder and will put a gas in the balloon upon contact with water.

3,786,591

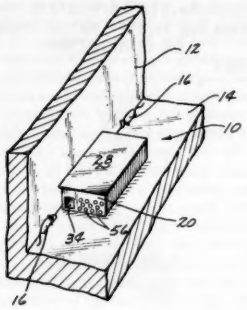
MOUSE TRAP

Marvin A. Morford, 1815 Ashworth Rd., West Des Moines, Iowa

Filed June 3, 1971, Ser. No. 149,459
Int. Cl. A01m 23/08
U.S. Cl. 43—66 1 Claim

A housing having trap passageways at opposite ends closely adjacent one housing side wall. A trap door or floor in the

passageway upon being pivoted downwardly under the weight of the mouse operates through a linkage a gate which pivots upwardly allowing the mouse to enter the interior of the housing whereupon the gate closes locking the mouse in the housing. A removable slidable top on the housing allows emptying



of the trap. Openings are provided in the gates and housing end walls. The oppositely disposed passageways close to one housing side wall accommodates the natural instincts of mice to keep close to a wall and seek safety in small openings and passageways.

3,786,592

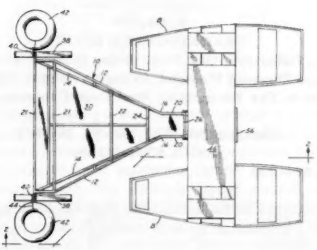
SEINE ASSEMBLY

Jack E. Miller, 325 S. Reynolds St., and Kenneth M. Garrett, 700 Allison Ave., both of Canon City, Colo.

Filed Sept. 25, 1972, Ser. No. 291,918

Int. Cl. A01k *79/00*

U.S. Cl. 43—6.5 **3 Claims**



A shallow water seine assembly especially useful for capturing large quantities of small aquatic creatures for use as live bait. An open frame is screened on two vertical sides and across its bottom to form a wide mouthed rearwardly and upwardly tapered capture chamber open at its front and top. Ski-like skids mounted on the bottom of the frame at each side of the front of the frame support the frame for sliding movement across the bottom of a pond. The rearward end of the frame in one form of the invention is mounted upon a platform which in turn is intended to be supported at opposite ends by a pair of small boats. The frame is hinged to the platform for pivotal movement about a horizontal axis normal to the direction of travel of boats. Buoyant elements are attached to the front end of the frame to support a major portion of the weight of the front end of the frame so that the entire seine assembly has a slight negative buoyancy.

3,786,593

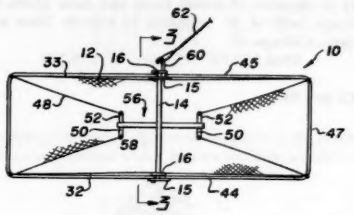
FOLDABLE TRAP

George Gerbrandt, 2273 Lawson Ave., West Vancouver, British Columbia, Canada

Filed July 31, 1972, Ser. No. 276,854

Int. Cl. A01k *69/00*

U.S. Cl. 43—100 **7 Claims**



A trap having a frame enclosed by a box-like net. The frame has a centre post and normally radially extending arms which are hinged to swing parallel to one another thereby folding the trap. A latching device is provided to hold the frame open or unfolded and resilient members apply tension to end walls of the trap which serve to keep the end walls taut and properly shaped to provide lead-ins to entrance openings formed therein.

3,786,594

METHOD OF RAISING AND HANDLING WASPS

Clarence A. Scott, Jr., Groom, Tex., assignor to Beneficial Insect Control, Inc., Groom, Tex.

Filed Apr. 17, 1972, Ser. No. 244,932

Int. Cl. A01m *5/00*

U.S. Cl. 43—124 **3 Claims**

Aphid infestation of crops such as alfalfa and milo is treated by first collecting aphid mummies, i.e., the dead carcasses of aphids within which eggs of the parasitic wasp, braconid lysiphlebus, have been laid. After the aphid mummies are collected, they are refrigerated and transported to the location of the infested fields to be treated. A plurality of mummies are then placed in a container open to the atmosphere in a field infested with aphids. Parasitic wasps hatch from eggs within the aphid mummies within a short period of time and leave the container. The wasps then attack and kill the live aphids infesting the crop by planting eggs in them which subsequently hatch into more wasps.

3,786,595

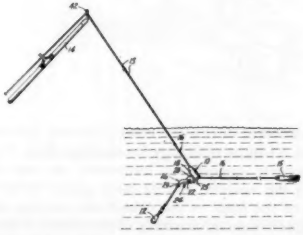
DEVICE FOR RELEASABLY CONNECTING A SINKER TO A LINE

Nicola Croce, 7511 Leesburh Pl., Bethesda, Md.

Filed Oct. 17, 1972, Ser. No. 298,452

Int. Cl. A01k *95/00*

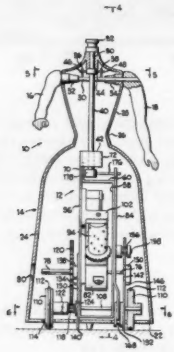
U.S. Cl. 43—44.87 **9 Claims**



A device for releasably connecting a sinker to a line comprising a body member having a bore therethrough and a lever

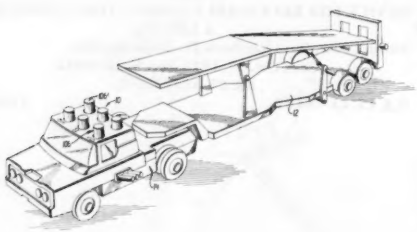
means attached to the body member. The lever means has a line-engaging portion at one end and a sinker attaching means at the other end. The lever is moveable between an engaged position and a released position.

3,786,596
ANIMATED MUSICAL FIGURE TOY
Jeffrey D. Breslow, Highland Park, and Bette Marie Kaelin, Chicago, both of Ill., assignors to Marvin Glass and Associates, Chicago, Ill.
Filed July 10, 1972, Ser. No. 270,229
Int. Cl. A63h *5/00*
U.S. Cl. 46—98 **9 Claims**



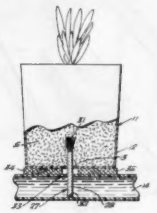
A doll having a movable head and movable upper arms and a lower torso comprised of a music box mechanism covered by a long skirt. The torso is positioned on a wheel-supporting platform having depending wheels and depending pivot structure.

3,786,597
AMUSEMENT DEVICE
Hiroshi Sano, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan
Filed July 21, 1972, Ser. No. 274,027
Int. Cl. A63h *33/26*
U.S. Cl. 46—243 LV **5 Claims**



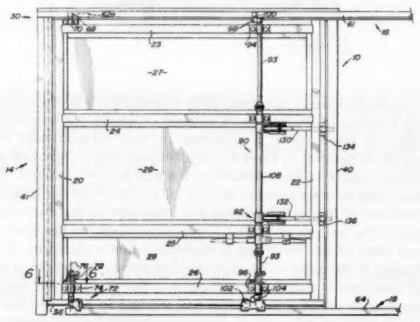
An amusement device featuring a vehicle provided with a motor and a source of energy for running same, one or more driving wheels operatively connected to the motor for propelling the vehicle, one or more guide wheels rotatably mounted to the front of the vehicle for steering same and a control panel mounted centrally of the vehicle featuring a plurality of buttons to be selectively depressed by the child for operatively connecting the motor and the source of energy and reversing the direction of the motor to reverse the direction of the driving wheel permitting the vehicle to remain stationary, move forward and move in reverse, as desired, and also rotating the guide wheel permitting the vehicle to move in a straight path and turn in either direction, as desired.

3,786,598
SELF-FEEDING WATERING SYSTEM FOR POTTED NURSERY PLANTS
Richard S. Stadelhofer, 14275 S. W. 232 St., Goulds, Fla.
Filed Aug. 10, 1971, Ser. No. 170,458
Int. Cl. A01g *27/00*
U.S. Cl. 47—38.1 **6 Claims**



A plurality of vertically-extending wick members arranged in regularly spaced rows serve to receive, impaled thereon through bottom openings, potted nursery plants. The wick members are substantially rigid except for frayed wick portions extending outwardly of their upper ends; and are of such length as to extend upwardly into the soil of the containers in the vicinity of the root systems of the plants. A plurality of horizontally-disposed water pipes through which the lower ends of the wick members extend supply water without pressure head to central wick cords within the wick members, which cords, by capillary attraction, conduct water upwardly to their frayed upper ends for distribution, also by capillary attraction, through the soil in the containers. As moisture is utilized by the growing plants, capillary attraction from the wick members serves to maintain substantially constant moisture content irrespective of the varying demands of the plants, thereby achieving optimum growth.

3,786,599
TRACKING PLUG DOOR
Leslie L. Galbarzyk, Oak Park; Irving D. Ross, Jr., Barrington, and Thorvald Madland, Arlington Heights, all of Ill., assignors to The Youngstown Steel Door Company, Chicago, Ill.
Filed June 20, 1972, Ser. No. 264,408
Int. Cl. E05d *15/10*
U.S. Cl. 49—220 **16 Claims**



The specification and drawings disclose an improved mounting and operating mechanism for a plug-type door. The

disclosed assembly is for use in a door opening defined by a frame including spaced first and second vertically extended frame members. Upper guideway means extend adjacent the top door opening and a lower guideway means extends under the door opening and longitudinally of the car past the second frame members. This permits a door to be moved longitudinally of the car away from the opening. A door member adapted to be received within the opening is mounted on the guideways and has leading and trailing lateral edges adapted to mate with the first and second lateral frame members respectively of the opening. Upper and lower sets of roller means support the door member. Each set of roller means includes at least one roller member located generally along the leading edge so that as the leading edge moves toward the first frame member, cooperation between the guideway means and the roller members cause the leading edge of the door to move into the opening. The upper and lower sets of roller means each further include at least a second roller member spaced from the first set in the direction of the trailing edge. Each of said second roller members is carried by crank arms on a vertically extending rotatable shaft assembly. Latch bolt means are mounted along at least the trailing edge for engaging the second door frame member when the door is in the opening. Additionally, actuating means are provided for rotating the shaft assembly and moving the latch bolt means. The actuating means include means for producing retraction of the latch bolts prior to rotation of the crank arms.

3,786,600

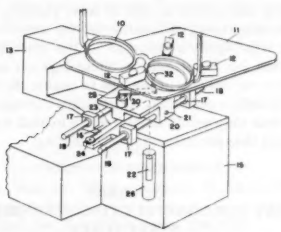
CONTOUR GRINDER

Joseph Thomas Bloxsom, Peekskill, N.Y., assignor to A. Lemay Co., Inc., Carmel, N.Y.

Filed Oct. 2, 1972, Ser. No. 294,350

Int. Cl. B24b *9/14;* **B23c** *1/18*

U.S. Cl. 51—101 LG **9 Claims**



An industrial shaping system to form various articles including eyeglass lenses. The invention specifically discloses an eyeglass frame pattern generator and edge grinder for shaping eyeglass lenses to fit a particular frame. A sensing wheel makes contact with the internal frame groove which is designed to hold the lens. The frame pattern generator controls an edge cutter by means of a servo system to shape the lens so that it will fit into the frame groove after the grinding operation. A computing device in the frame pattern generator is arranged to correct for the inherent errors generally present in all contour devices employing a tracing mechanism and a grinding cutter where grinding is done along the circumference of the grinding wheel.

3,786,601

APPARATUS FOR DE-BURRING OR CHAMFERING OF GEARS

Horst Seidensticker, Lonkert 32, Brackwede, Germany

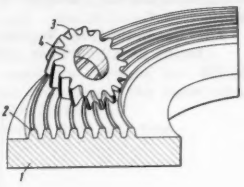
Filed July 1, 1971, Ser. No. 158,876

Claims priority, application Germany, July 2, 1970, P 20 32 759.7

Int. Cl. B24b *5/02*

U.S. Cl. 51—129 **9 Claims**

An apparatus for de-burring or chamfering of gears has at least one disk member of abrasive material one or both major surfaces of which are provided with helical or concentric ribs of the abrasive material. The ribs have a cross-sectional profile



corresponding to that of the teeth on gears to be processed, and a drive is provided which rotates the disk member about its axis of rotation which is encircled by the ribs.

3,786,602

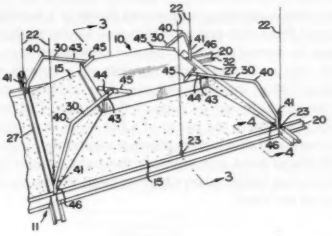
MODULAR CEILING ASSEMBLY

Joseph D. Wilkin, Tampa, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Filed May 1, 1972, Ser. No. 248,950

Int. Cl. E04b *5/52*

U.S. Cl. 52—28 **6 Claims**



A modular light fixture and sound absorbing panel assembly which can be easily inserted into place in a preassembled suspension system with the support hangers for the suspension system being symmetrically located with respect to the supporting legs of the modules.

3,786,603

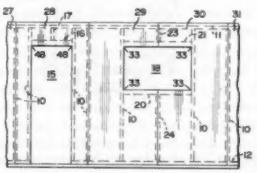
METHOD OF RELIEVING STRAINS IN A WALL AND CONSTRUCTION THEREFOR

David P. Kasprzak, Largo, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Filed May 3, 1972, Ser. No. 250,075

Int. Cl. E04g *23/02*

U.S. Cl. 52—204 **7 Claims**

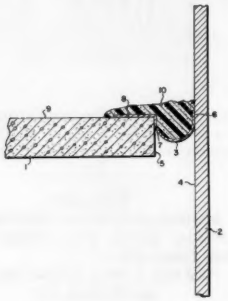


A method for and construction resulting from scoring the paper cover sheet of a gypsum wallboard from corners of openings therein to relieve strains and control cracking of the wallboard.

3,786,604
FIRE STOP BETWEEN FLOOR SLAB AND CURTAIN WALL OF BUILDING

Fritz Kramer, Woodside, N.Y., assignor to U. F. Chemical Corp., Woodside, N.Y.

Filed Dec. 6, 1971, Ser. No. 205,106
Int. Cl. E04c *2/00*; **E04b** *1/74*
U.S. Cl. 52—232 **5 Claims**

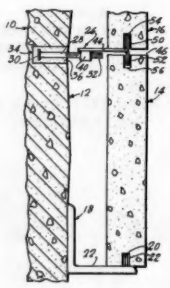


A fire stop separating superposed floors of a building having a concrete floor slab and a curtain wall horizontally separated by a gap to permit relative thermal expansion movement of the slab and wall essentially consists of a trough of pliable sheet steel filling the gap, and urea formaldehyde resin foam filling the upwardly open cavity of the trough. The foam chars, but does not burn in the event of a fire so as to retain its cellular structure and much of its thermal insulating properties, and the thin sheet steel can support the light foam and its own weight even at temperatures high enough to reduce the tensile strength of the steel.

3,786,605
STONE ANCHOR

Hal C. Winfrey, 4160 Hawkeye Way, De Kalb County, near Stone Mountain, Ga.

Filed Mar. 16, 1971, Ser. No. 124,728
Int. Cl. E04b *1/41, 2/88*
U.S. Cl. 52—235 **6 Claims**

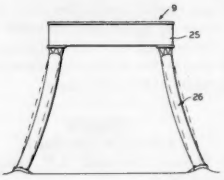


A stone anchor for attachment between the face of a building and pieces of veneer such as stone. A threaded anchor stud carries an internally threaded collar which is attached to the flat plate that extends between joints in adjacent courses of stone. The flat plate may carry angular portions at the end which extend into kerfs formed in the respective adjacent stones. The end of the stud is inserted into a hole in the face of the wall and secured therein by mortar, adhesive and the like and thereafter the collar with the plate may be screwed in or out relative to the face of the wall to adjust the stone anchor to the proper extension thereby eliminating altogether the use of a variety of different sizes of stone anchors. In one form the plate is split on the end and turned in opposite directions whereas in another form a pin is secured perpendicularly to the plate.

3,786,606
SUPPORTING APPARATUS FOR VESSELS

Melvin J. Greaves, Cleveland, and Tage Werner, Rocky River, both of Ohio, assignors to Arthur G. McKee & Company, Cleveland, Ohio

Division of Ser. No. 811,527, March 28, 1969, Pat. No. 3,630,507, which is a continuation-in-part of Ser. No. 778,883, Aug. 29, 1968, Pat. No. 3,559,972, which is a division of Ser. No. 520,945, Jan. 17, 1966, Pat. No. 3,431,691. This application Apr. 26, 1971, Ser. No. 137,640
Int. Cl. E04c *3/10*
U.S. Cl. 52—223 **7 Claims**

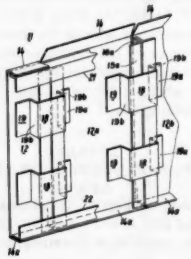


Apparatus for supporting a vessel, such as a blast furnace having a shell, comprising a main frame that surrounds the shell and is connected to and at least partially supports the shell. The supporting apparatus for the vessel also includes diverging legs rigidly connected to the main frame; during construction the lower ends of these legs are supported off-center from the centers of the legs to enable the lower ends of the legs to deflect outwardly by amounts corresponding to the amounts that they would deflect when loaded with the vessel. The legs are thus prestressed before loading.

3,786,607
ELEMENT FOR CONSTRUCTING TEMPORARY WALL STRUCTURES

Friedrich Bartels, Tilsiter Str. 144, Hamburg, Germany

Filed May 12, 1972, Ser. No. 252,857
Claims priority, application Germany, May 21, 1971, P 21 25 373.6
Int. Cl. A63j *23/00*
U.S. Cl. 52—474 **11 Claims**



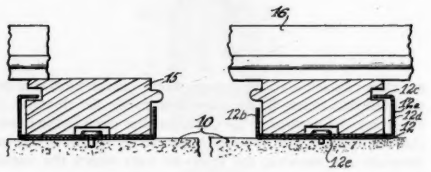
An element for constructing a temporary wall or partition made from corrugated cardboard sheet parts and scored so as

to be foldable to form side surfaces by which adjacent parts can be joined, other edges of the sheet parts being folded at right angles and the joins between adjacent parts being effected by U-form brackets overlying the join. Two assembled elements are connected back to back to form a rigid cavity structure.

3,786,608
FLOORING SLEEPER ASSEMBLY

William A. Boettcher, 4507 N. Clark St., Chicago, Ill.

Filed June 12, 1972, Ser. No. 262,057
Int. Cl. E04b *5/00*
U.S. Cl. 52—480 **4 Claims**

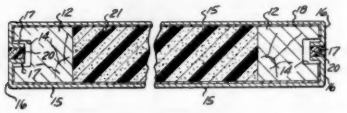


A flooring sleeper assembly comprising a retainer and flooring sleepers made up of a linear series of sections. These are of floor board material and have a slot in one side edge. The present retainer is a long, metallic receptacle for the series of sleeper sections, such receptacle rising with a channel on one side which terminates with an inward hook directed into the sleepers' slot. On the opposite side the receptacle rises with a vertical flange. The latter and the channel form guards to check lateral shifting tendencies of the sleeper sections; and the hook checks them from rising out of the retainer.

3,786,609
CORED INSULATED DOOR

Joseph Difazio, Warren, Mich., assignor to Acorn Products Company, Detroit, Mich.

Filed Jan. 7, 1972, Ser. No. 216,053
Int. Cl. E04b *1/68, 2/28*
U.S. Cl. 52—619 **1 Claim**

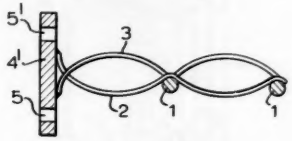


A slab door formed of a wood frame having a wide, deep, vertically extending groove formed in the exposed edges of each of the opposite vertical frame stiles, and each face of the frame being covered by a thin sheet of metal whose opposite vertical edges are bent into flanges covering the stile edges and loosely extending into their adjacent groove. The adjacent pair of flange portions within each groove are spaced apart and bonded together by a plastic filler material. Thus, a rigid slab unit is formed by the sheets of metal bonded together at their vertical edge flanges and adhesively secured to the frame, with the sheets being thermally insulated from each other by the plastic material which also seals the vertical edges of the slab against moisture penetration.

3,786,610
REINFORCING ELEMENT FOR CONCRETE STRUCTURES

Horst Glatz, Eldagsen Hanover, Germany, assignor to Deumu Deutsche Erz-und Metall-Union Gesellschaft mit beschrankter Haftung, Hanover, Germany

Filed Dec. 3, 1971, Ser. No. 204,653
Claims priority, application Germany, Dec. 17, 1970, P 20 62 099.9. The portion of the term of this patent subsequent to June 19, 1990, has been disclaimed.
Int. Cl. E04c *2/42, 5/04*
U.S. Cl. 52—661 **7 Claims**

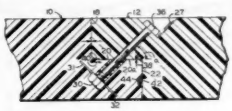


The invention is concerned with mat-like or plate-shaped elements such as are used as reinforcing elements and as shuttering in the production of concrete structures. These elements are generally somewhat flexible in character and when of large size or formed into an assembly of large size have hitherto had to be supported in their predetermined position until hardening of the concrete applied is completed. The reinforcing elements of the present invention are made substantially self-supporting by the arrangement along at least one edge of a supporting element which is resistant to bending. Suitably the supporting element resistant to bending is a steel section applied to a reinforcing element which comprises parallel longitudinal ribs of rod-like steel connected by parallel strip-like transverse ribs bent alternately in the one and other direction perpendicular to the plane of the plate.

3,786,611
FASTENING SYSTEM FOR JOINING STRUCTURAL MEMBERS

Boyd E. Brown, Hubbard, and Eric A. Brown, Portland, both of Oreg., assignors to Ordeco, Inc., Woodburn, Oreg.

Filed Jan. 14, 1972, Ser. No. 217,854
Int. Cl. F16b *5/02*
U.S. Cl. 52—753J **8 Claims**

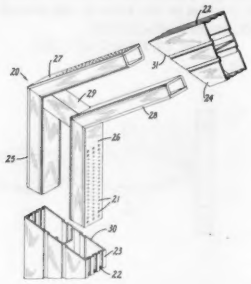


Two mold-formed polyurethane foam structural members are joined in edge-abutting relationship at interfitting complementary stepped edges. A threaded fastener extends from an external surface of one member at an oblique angle through an abutting set of edge surfaces of the stepped edges into threaded engagement with a nut embedded within the other so as to draw together the corresponding edge surfaces of the two stepped edges. The nut has wing-like projections which resist its rotation within and withdrawal from such other member. The nut is embedded within its parent member during the mold-forming of such member. Similarly, the required stepped edges and pilot hole leading to the embedded nut are formed as the member is mold-formed. A threaded fastener extending into the mold cavity through a pilot hole in the mold positions the nut within the mold cavity, and a sleeve surrounding the portion of the fastener within the cavity defines the pilot hole to the nut during the mold-forming process.

3,786,612
ANGLE CONNECTORS FOR MODULAR BEAM STRUCTURES

William H. Baker, 403 Loudonville Rd., Albany, N.Y.

Filed Nov. 17, 1970, Ser. No. 90,305
Int. Cl. F16b 7/00
U.S. Cl. 52—754 5 Claims

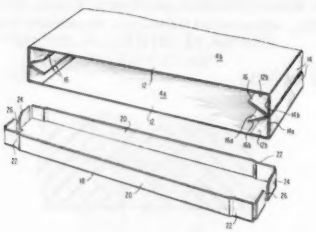


Angle connectors are provided for modular box beam building members. The connectors have two opposed pairs of substantially parallel support members, attached to and extending from a base member, one support member of each pair being disposed substantially in alignment with one support member of the opposite pair, and at an angle thereto corresponding to the angle of the connection to be made.

3,786,613
SHEET METAL DOOR WITH FOAM PLASTIC CORE

William L. Shepheard, 3040 Broad Creek St., Norfolk, Va.

Filed June 9, 1972, Ser. No. 261,425
Int. Cl. EO6b 3/70; EO4c 2/40
U.S. Cl. 52—619 3 Claims



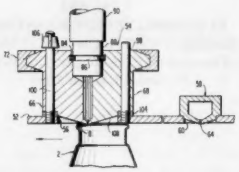
The shell of a sheet metal door is formed of two opposed wide, shallow trough-like members each having opposed edge layers folded back upon one another to provide greater thicknesses of metal at the edges than at the panels.

3,786,614
CONTAINER FILLING AND CAPPING APPARATUS

Robert J. Mistarz, Northbrook, Ill., assignor to Koehring Company, Milwaukee, Wis.

Filed Feb. 15, 1972, Ser. No. 226,582
Int. Cl. B65b 55/24
U.S. Cl. 53—167 16 Claims

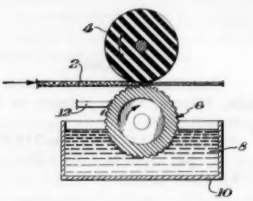
A milk bottling machine includes a spin welder for joining together plastic container halves, means for filling the thus formed containers with milk and means for heat sealing caps in place on the open tops of the filled containers. In order to assure good sealing between the caps and the container lips, each container lip is acted upon by one or more vacuum heads as it is moved from the container filling station to the point where a cap is applied to the container. The vacuum heads remove drops of milk which may have been deposited onto the container lip at the filling station. Each vacuum head is so constructed that it may be disassembled readily for cleaning, and steam may be applied to the container lips prior to the passage thereof beneath the vacuum heads so as to dilute the milk droplets and increase the intervals over which the vacuum heads may be used without becoming clogged.



3,786,615
PROCESS FOR PREPARING PRE-MOISTENED ANTIMICROBIAL TOWELS

Stuart M. Bauer, Succasunna, N.J., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 13, 1972, Ser. No. 305,859
Int. Cl. B65b 63/04
U.S. Cl. 53—21 FC 6 Claims



A process for the preparation of pre-moistened antimicrobial towels is disclosed.

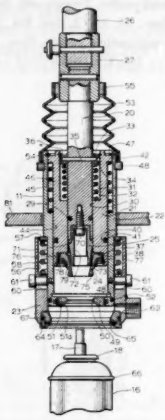
3,786,616
APPARATUS FOR SECURING AND SEALING A CLOSURE CAP TO A RECEPTACLE

John C. Nalbach, La Grange Park, and Graeme W. Warner, Hinsdale, both of Ill., assignors to John R. Nalbach Engineering Company, Chicago, Ill.

Filed May 2, 1972, Ser. No. 249,514
Int. Cl. B65b 31/02, 7/28
U.S. Cl. 53—88 6 Claims

Apparatus for securing and sealing a closure cap to a receptacle and for evacuating air from the receptacle including a head assembly actuated by an air cylinder, the head assembly including coaxially disposed outer, central and inner sleeve members slidable relative to each other, the outer sleeve member having means thereon to establish a sealed relation-

ship with the receptacle to allow a vacuum to be pulled on the receptacle, the central sleeve having means thereon for hold-



ing a closure cap firmly in the receptacle opening, and the inner sleeve having means thereon for securing the closure cap to the receptacle.

3,786,617

DEVICE FOR THE AUTOMATIC FILLING OF BISCUITS INTO PACKAGING CONTAINERS

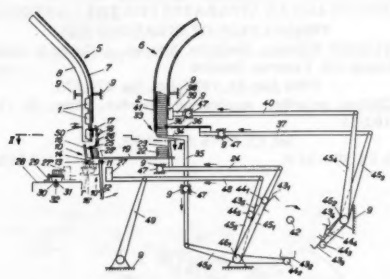
Rene Fluck, Neuhausen am Rheinfall, Switzerland, assignor to Schweizerische Industrie-Gesellschaft, Rhienfall, Switzerland

Filed June 2, 1972, Ser. No. 259,137

Claims priority, application Switzerland, June 15, 1971, 8716/71

Int. Cl. B65b *5/06, 35/30*

U.S. Cl. 53—154 **7 Claims**



A device for automatic filling of biscuits into packaging containers which are open on one side is provided with a vertical channel for feeding the containers downwardly one by one onto a pivot support with the open side of the container facing sideways toward an article feed device which horizontally moves one stack of biscuits at a time into the sideways open container on said support. When the container is filled the pivot support swings the filled container about 90° so that the open side of the container faces upwardly, whereupon the filled container is conveyed away from the device along a horizontal discharge track.

3,786,618

INSTALLATION FOR DEFOAMING LUBRICANTS

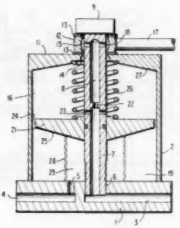
Karl Sommerfeld, and Herbert Zelldann, both of Fellbach, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Dec. 15, 1971, Ser. No. 208,320

Claims priority, application Germany, Dec. 15, 1970, 2061597

Int. Cl. B01d *19/00*

U.S. Cl. 55—159 **25 Claims**



An installation for defoaming lubricants, in particular for the supply of hydraulic valve lifter elements in internal combustion engines and the like, in which a center pipe extending substantially vertically through the housing is adapted to be connected with the supply channel conducting the oil from the feed pump; the center pipe is provided internally with a throttling place and upstream thereof with apertures in communication with a housing space that is considerably larger than the bore in the center pipe; oil which is defoamed and possibly also filtered is conducted off through an opening provided in the bottom of the housing whereas oil that might still contain air, is able to flow off through an opening provided in the upper portion of the housing space into the line leading back to the oil sump.

3,786,619

METHOD OF PURIFYING GASES CONTAINING MERCURY COMPOUNDS AND ELEMENTARY MERCURY

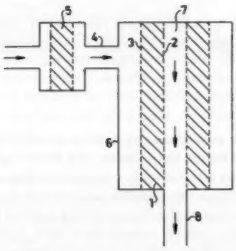
Karl-Axel Melkersson, Helsingborg, and Bo Gustav Valter Hedenas, Viken, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed June 1, 1972, Ser. No. 258,626

Claims priority, application Netherlands, June 4, 1971, 7237

Int. Cl. B01d *53/04*

U.S. Cl. 55—72 **9 Claims**

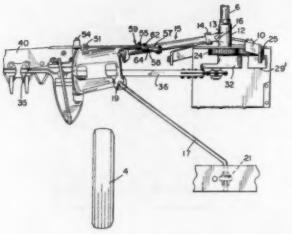


A method of purifying gases containing gaseous mercury. Mercury containing gas is passed through a mass of purifying material containing as an active constituent a material consisting of selenium, selenium sulphide or other selenium compounds or mixtures thereof.

3,786,620
BALANCED MOWER

Thomas J. Scarnato, Barrington; Paul C. Gordon, Hinsdale; Robert Sorensen, Glen Ellyn, and Craig M. Lawler, Downers Grove, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed May 19, 1972, Ser. No. 254,979
Int. Cl. A01d *35/08, 55/02*
U.S. Cl. 56—16.3 9 Claims

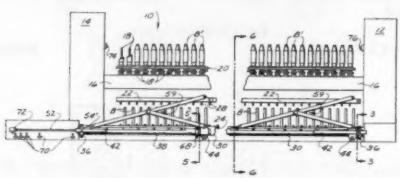


A mower having a stationary cutter bar and a sickle reciprocal thereon, and a drive which comprises a pitman connected to the sickel and driven by a crank which has a counterweight. The crank is connected by a flexible, preferably nylon, gear assembly to a counterbalancing counterweight. Both counterweights are arranged in a meshing relation and in planes parallel to the longitudinal axis of the sickle. Certain force couples and unbalancing forces are modulated by deflection of the plastic gear teeth.

3,786,621
GRASPER BAR POSITIONING MECHANISM FOR AUTOMATIC DOFFER

Lester W. Pray, Clemson; John H. Christeson, Seneca; Frederick A. Preston, Clemson; Herman D. Sheron, Jr., Seneca; William H. Drake, and Gordon C. Anderson, both of Clemson, all of S.C., assignors to Maremont Corporation, Chicago, Ill.

Continuation of Ser. No. 864,399, Oct. 7, 1969, abandoned.
This application Oct. 13, 1971, Ser. No. 188,767
Int. Cl. D01h *9/00*
U.S. Cl. 57—52 10 Claims

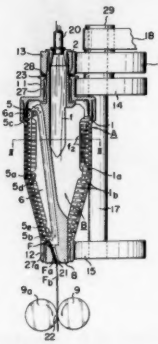


Bobbins are moved during doffing between a position upon and a position below the spindles of a textile spinning frame or like machine by a retractable mechanism disposed when not in use entirely below the spindles so as to not impede end-down or other servicing of the frame during normal spinning operations. Multiple guided connections with hydraulic cylinder and piston assemblies provide the smoothness and precision of grasper-bar movement necessary for successful performance of the bobbin doffing and donning operations. Critical components of the mechanism are shielded from the ambient atmosphere and from accidental impacts. Completion of each phase of the grasper bar's movement is verified before commencement of its next movement, and a photoelectric stop-motion device detects non-doffing of any bobbin.

3,786,622
YARN SPINNING METHOD AND APPARATUS THEREFOR

Eizaburo Negishi, Yono, Japan, assignor to Kabushiki Kaisha Negishi Kogyo Kenkyusho, Urawa-shi, Saitama-ken, Japan

Filed Nov. 15, 1972, Ser. No. 306,826
Claims priority, application Japan, Nov. 15, 1971, 46-91767
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.89 7 Claims

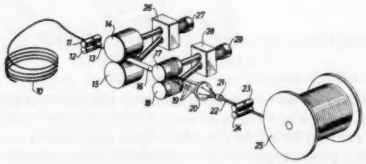


A new improved yarn spinning method of the open-end spinning system, which method comprises the steps of collecting the fibers to be processed thereby to form a sliver in an inner rotor disposed in an outer rotor, said rotors being differentially rotated, transferring successively the thus formed sliver toward a spinning-out direction, and drawing said sliver in order to stretch or draft thereby to automatically twist said stretched or drafted sliver, thus producing an excellent yarn. Furthermore, an apparatus adapted to carry out effectively the aforementioned method and modifications of this apparatus are disclosed.

3,786,623
METHOD AND AN APPARATUS FOR THE CONTINUOUS PRODUCTION OF STRANDED WIRE

Karl Bertil Eliasson, Vasteras, Sweden, assignor to Granges Essem AB, Vasteras, Sweden

Filed July 24, 1972, Ser. No. 274,375
Claims priority, application Sweden, Aug. 8, 1971, 10102/71
Int. Cl. D07b *3/00, 3/12, 7/00*
U.S. Cl. 57—34 R 4 Claims



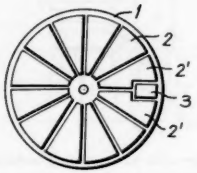
The present invention relates to a method and an apparatus for the continuous production of a twisted stranded wire by flattening a strand of wire, shearing it into a plurality of strands, and twisting the strands together.

3,786,624

SOLAR CELL WATCH DIAL HAVING CALENDAR DISPLAY WINDOW

Hideaki Uchiyama, Swa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed July 3, 1972, Ser. No. 268,325
Claims priority, application Japan, July 9, 1971, 46/50870
Int. Cl. G04c *3/00*; G04b *19/24*
U.S. Cl. 58—23 C 2 Claims



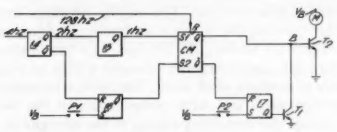
A timepiece has a plurality of solar cell elements arranged on the surface of the dial thereof, the dial being formed with a window through which a time or calendar indication may be viewed. The portion of one or more of the solar cell elements in the region of the window is removed. The elements having portions removed are connected in parallel with each other if the total light receiving area thereof is not less than the light receiving area of other of said elements, otherwise, the elements having portions removed are electrically disconnected from the other of said elements.

3,786,625

ARRANGEMENT FOR CORRECTING OF SECONDS INDICATION OF A TIMEPIECE

Pierre Sauthier, Bienne, Switzerland, assignor to Societe Suisse Pour L'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Dec. 5, 1972, Ser. No. 312,328
Claims priority, application Great Britain, Dec. 16, 1971, 58,470/71
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 R 10 Claims



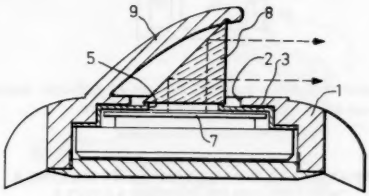
A correction circuit for a timepiece is driven by digital pulses to advance the timepiece display by one second in response to each pulse. A first push button switch is provided for eliminating one pulse, and a second push button switch is provided for inserting an additional pulse into the sequence of pulses applied to the display, to thereby provide correction of the time displayed by the timepiece.

3,786,626

DIGITAL WATCH

Zeno Hurt, Mohlin, Switzerland, assignor to AGON Uhrenfabrik Robert Triebold AG, Mumpf, Switzerland

Filed Apr. 5, 1973, Ser. No. 348,174
Claims priority, application Switzerland, May 10, 1972, 6923/72
Int. Cl. G04b *37/00, 39/00, 19/06*
U.S. Cl. 58—88 R 6 Claims



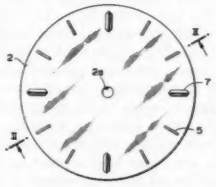
A digital watch in which the numerals move beneath windows of a cover plate and possessing a reflecting element for reading the time in a direction which is at least approximately parallel to the cover plate.

3,786,627

DIAL PLATES FOR TIMEPIECES

Tooru Takagi; Tsuneyoshi Shinoyama, and Setsuo Satoh, all of Tokyo, Japan, assignors to Orient Watch Co., Ltd., Tokyo, Japan

Filed Sept. 26, 1972, Ser. No. 292,322
Claims priority, application Japan, Dec. 8, 1971, 46-99151; Apr. 17, 1972, 47-38485
Int. Cl. G04b *19/06*
U.S. Cl. 58—127 R 6 Claims



A dial plate for timepieces consisting of a metallic base plate and a thin shell plate having a nacreous gloss and bonded to said metallic base plate with the nacreous surface thereof exposed to the outside by means of an adhesive, in which said thin shell plate is bonded to said metallic base plate at an opaque layer formed on said thin plate or plating applied to the back side thereof.

3,786,628

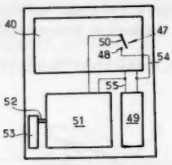
WARNING SYSTEM AND METHOD

Hubert Rene Louis Fossard, Rue de Vitot, Le Neubourg, and Henriette Josephine Joly, 22 Avenue Parmentier, Paris, both of France

Filed Apr. 28, 1972, Ser. No. 248,611
Claims priority, application France, Apr. 30, 1971, 71.15615
Int. Cl. G06b *23/12*
U.S. Cl. 58—152 B 1 Claim

A warning device particularly useful for the deaf or partially deaf comprising a mechanical vibration generator responsive

to signals produced by a trigger signal generator to which it is operatively connected, the trigger signal generator being



responsive to various external sources of different natures, such as an alarm clock, a door bell or a car horn.

3,786,629

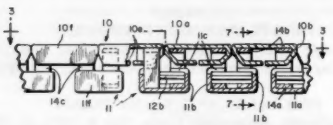
EXPANSIBLE LINKAGE FOR USE IN MAKING A WATCHBAND OR SIMILAR ARTICLE

Kurt A. Rieth, Warwick, R.I., assignor to Textron, Inc., Providence, R.I.

Filed June 29, 1972, Ser. No. 267,419

Int. Cl. F16g *13/24*

U.S. Cl. 59—79 R **11 Claims**



An expansible linkage for use as a watchband, bracelet or similar article having two rows of overlapping staggered links, connecting members displaceably connecting the links of the inner row to the links of the outer row and springs in the inner row for urging the links from their expanded to their contracted positions. The springs are located only in the links of the inner row of links. Each of the links of the outer row has an outer wall, a narrower inner wall substantially parallel to the outer wall, a pair of substantially parallel first side walls connected to the opposite sides of the outer wall and a pair of second side walls which converge inwardly from the inner sides of the first side walls to lateral sides of the inner wall. In one embodiment, the outer wall of each of the links of the outer row of links has an opening formed at one side thereof intermediate its ends and an extension at the opposite side thereof which is of substantially the same size as said opening so that when the linkage is in contracted position the extension is positioned in the opening of the outer wall of the adjacent link. In this embodiment, each of one of the first side walls of each of the links of the outer row of links includes an opening formed therein which communicates with the opening in the outer wall of the link.

3,786,630

DEVICE FOR CONNECTING EXHAUST MANIFOLD SETS TO THE TURBO-BLOWERS OF A SUPERCHARGED INTERNAL-COMBUSTION ENGINE

Karl Walter Kuhn, Saint-Germain-en-Laye, and Jacques Gallois, Paris, both of France, assignors to Societe D'Etudes de Machines Thermiques, St. Denis, France

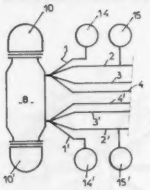
Filed Nov. 23, 1971, Ser. No. 201,410

Claims priority, application France, Jan. 15, 1971, 71.01345

Int. Cl. F02c *37/04*

U.S. Cl. 60—13 **4 Claims**

In a supercharged internal combustion engine provided with two rows of V-shaped cylinders, each row being fed by a turbo-blower and having an associated cluster of exhaust manifolds, an arrangement for connecting said clusters of exhaust manifolds to said turbo-blowers, wherein each cluster of exhaust manifolds is connected by a convergent nozzle forming a pulse converter with its associated turbo-blower through a compact intermediate chamber common to both clusters, said chamber being mounted between the turbo-blowers and forming a mixing and attenuating casing.



3,786,631

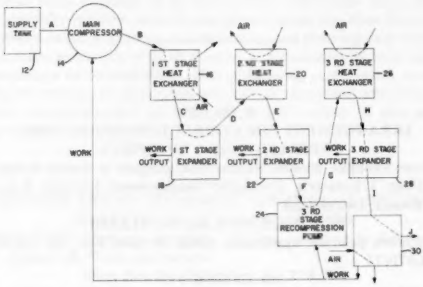
NITROGEN VAPOR ENGINE

Lindley Manning, 4585 Clearview Dr., and Richard N. Schneider, 1950 Castle Way, both of Reno, Nev.

Filed Sept. 23, 1971, Ser. No. 182,994

Int. Cl. F01k *25/10*; **F03g** *7/04*

U.S. Cl. 60—26 **4 Claims**



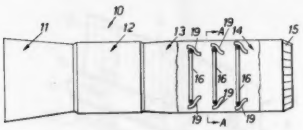
An open-cycle thermodynamic engine using a working fluid which is a gas at ambient conditions and which is liquefiable at temperatures below ambient. The engine operates by compressing the working fluid, such as liquid nitrogen, with a pump, convectively heating the nitrogen in a heat exchanger, and isentropically expanding the nitrogen within an expandable chamber to produce shaft work. The cycle is repeated both without compression and with compression of the working fluid. To salvage the remaining energy in the nitrogen or other fluid, an exhaust engine is used. In one embodiment the exhaust engine uses an expandable chamber and piston driven by a plurality of long, small diameter heat responsive wires coupled under tension between the chamber wall and piston. When gases of different temperatures are directed across the chamber, the wires expand and contract thereby reciprocally moving the piston. In another embodiment of the heat engine a manifold is connected to numerous closed tubes in which nitrogen is heated by natural convention. When the pressures within the tubes reach a maximum, the tubes are selectively exhausted against a double acting piston to produce work.

3,786,632

REHEAT SYSTEM FOR A GAS TURBINE ENGINE

Donald Maynard Anley, Long Eaton, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Aug. 7, 1972, Ser. No. 278,342
Claims priority, application Great Britain, Aug. 21, 1971, 39,332/71
Int. Cl. F02c 7/22
U.S. Cl. 60—39.74 R 5 Claims



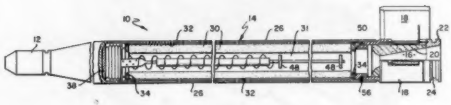
A reheat system for a gas turbine engine is provided with fuel supply means, a plurality of fuel manifolds having fuel distribution holes or nozzles located thereon, fuel/exhaust gas mixing means associated with each of the holes or nozzles and flame stabilisation means located downstream of the fuel manifolds. The mixing means are adapted in operation to tap exhaust gases from a portion of the reheat system, to mix the exhaust gases with fuel from their respective associated fuel nozzles or holes and exhaust the mixture into the combustion zone of the reheat system.

3,786,633

PROPELLANT IMMOBILIZER AND RESONANCE SUPPRESSION SYSTEM

Francis J. Worcester, La Plata, Md., and William H. Ailor, III, West Lafayette, Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1973, Ser. No. 327,046
Int. Cl. F02k 9/06
U.S. Cl. 60—255 14 Claims



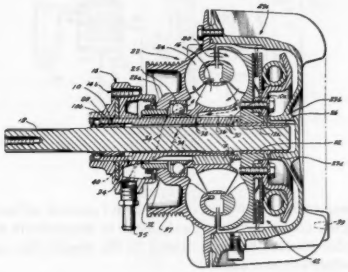
A system for immobilizing solid propellant grain while providing an improved mechanical suppression of resonant burning comprises a small diameter, tension spring extending within the center bore of the grain. The spring is fastened at the forward end to a spacer abutting the grain while the other end is fastened to a resonator rod positioned within the center bore. An immobilizing force is thus exerted upon the grain which does not appreciably vary with ambient temperature changes. The spring is free to oscillate in the longitudinal and transverse modes thus serving more effectively as a mechanical resonance suppressor.

3,786,634

CANTILEVERED HYDROKINETIC CONVERTER HAVING IMPROVED BEARING STRUCTURE

Waldo E. Rodler, Jr., San Jose, Calif., assignor to Instrument Systems Corporation, Jericho, N.Y.

Filed July 13, 1972, Ser. No. 271,565
Int. Cl. F16h 41/04
U.S. Cl. 60—361 8 Claims



A hydrokinetic converter has an elongated, tubular-shaped reactor mounting shaft and an elongated central shaft coaxially mounted in the reactor shaft that has at least one exposed end extending out from a first end of the reactor shaft. A mounting structure is rigidly affixed to the opposite end of the reactor shaft from the first end and has mounting means for mounting the reactor shaft and the hydrokinetic converter to another member. A hydrokinetic bladed reactor is mounted at the first end of the reactor shaft. A first hydrokinetic bladed member is rigidly affixed to and mounted on the exposed end of the reactor shaft. An enclosing member is mounted around and encloses the reactor and the first member and comprises a hydrokinetic bladed second member mounted over the reactor shaft. The enclosing member further comprises a first end rotatably mounted and supported on the reactor shaft and a second end rotatably mounted and supported on the exposed end of the central shaft. One of the bladed members comprises an impeller and the other bladed member comprises a turbine. The hydrokinetic bladed reactor, impeller and turbine are adapted to direct fluid from the impeller through the turbine to the reactor, causing rotation of the turbine upon rotation of the impeller. First and second bearings are spaced apart in between the reactor shaft and output shaft for rotatably mounting the same. The first bearing is positioned adjacent the first end of the reactor shaft and provides the load path from the exposed end of the central for the second enclosing member and the first bladed member back to the cantilever mounted reactor shaft.

3,786,635

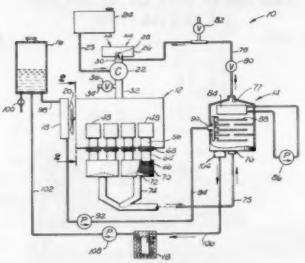
INTERNAL COMBUSTION ENGINE WITH MODIFIED AND CONTROLLED EXHAUST

Frank F. Kates, Irvine, and George E. Faber, Santa Ana, both of Calif., assignors to Krun Corporation, Santa Fe Springs, Calif.

Filed Dec. 20, 1971, Ser. No. 210,006
Int. Cl. F02m 25/06; F01n 3/04
U.S. Cl. 60—278 7 Claims

The exhaust gases and fluids from an internal combustion engine which is using gasoline and air as fuel, are passed

through a metal screen and a bed of activated carbon whereby a modification of the gases occur, and thence through a condenser where water and solids are removed therefrom, with



from zero to about twenty (20 percent) percent of the gases leaving the condenser being exhausted to atmosphere and the remainder thereof being returned to the engine for reuse in the combustion process.

3,786,636

HYDRAULIC BRAKE BOOSTER

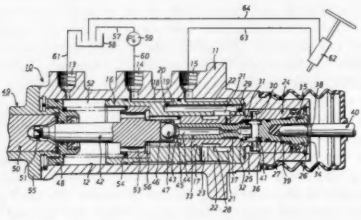
Uichiro Kobashi, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Dec. 17, 1971, Ser. No. 209,107

Claims priority, application Japan, Dec. 18, 1970, 45-114510

Int. Cl. F15b *7/00, 9/00, 13/14*

U.S. Cl. 60—548 **15 Claims**



Disclosed herein is a hydraulic brake booster for a brake system of a vehicle utilizing a hydraulic pressure source for a hydraulic power control system of the vehicle, wherein the booster comprises a casing mounted on the brake master cylinder, a booster piston reciprocable within the casing and in operable connection with the master cylinder piston, the booster piston forming a drain chamber, a control piston reciprocable within the bores of the casing and the booster piston and in operable connection with the push rod of the brake pedal, the control piston forming a pressure chamber, a passageway for leading operating fluid to flow toward the power control system through the booster, and a first and second valve means respectively for controlling communication between the pressure and drain chambers and between the pressure chamber and the passageway in response to actuation of the brake pedal, thereby to obtain desired braking force without disturbing operation of the power control system.

3,786,637

OIL FENCE

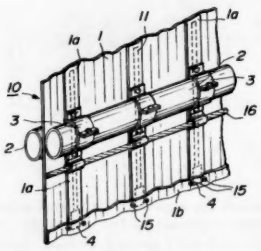
Tateo Muramatsu; Kuninori Aramaki, both of Yokohama, and Yoshikazu Kondo, Tokyo, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 7, 1972, Ser. No. 232,399

Claims priority, application Japan, Mar. 13, 1971, 46-13519

Int. Cl. E02b *15/04*

U.S. Cl. 61—1 F **4 Claims**



An oil fence comprising an elongated resilient belt member and a float secured to it for keeping at least a part of the belt member floating above water level. The floating portion of the belt member is kept substantially upright by a weight means and reinforcing means. The oil fence so flexes as to conform with the profile of water surface.

3,786,638

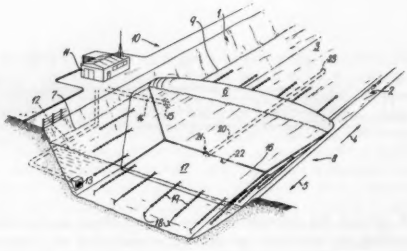
INFLATABLE DAMS AND DAM UNITS

Daniel Cecil Edward Fish, Broadthorn, Armstrong Ln., Brockenhurst, England

Filed June 27, 1972, Ser. No. 266,554

Int. Cl. E02b *7/02*

U.S. Cl. 61—30 **5 Claims**



An inflatable dam unit with means to anchor it to the bed of a water course. These means are in two parts, one which primarily resists bodily movement of the unit downstream and the other which concentrates on resisting the tendency of the unit to roll. The invention also includes dams including such units when installed, and methods of damming water flow.

3,786,639

METHOD AND APPARATUS FOR BACKFILLING AN UNDERGROUND CAVITY

Stephen Pineno, 37 E. Seventh St., Wyoming, Pa., and Albert Tamburro, 32 New St., Pittston, Pa., assignors to said Pineno and Tamburro

Filed Dec. 18, 1972, Ser. No. 316,067
Int. Cl. E21p *15/08*
U.S. Cl. 61—35 18 Claims

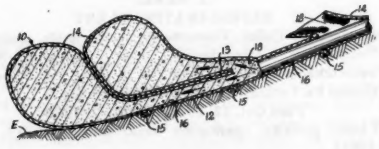
A system for backfilling an underground cavity, such as a coal mine or the like, wherein a slurry of fill material is uniformly displaced and propelled in all directions in the cavity through the aid of a high pressure air jet.

3,786,640

MEANS AND METHOD FOR PRODUCING STEPPED CONCRETE SLOPE STRUCTURES

Lee A. Turzillo, P.O. Box 155, Bath, Ohio

Filed Dec. 15, 1971, Ser. No. 208,267
Int. Cl. E02d *17/20*
U.S. Cl. 61—37 9 Claims



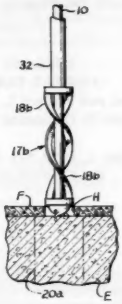
Container means, and method utilizing same for forming a mat-like protective cover of hardenable, cementitious material on a sloping surface of an earth situs, for example. Container means includes rectangular sheet-like flexible web which is spread flatwise on surface to be protected, and series of transversely extending porous fabric containers of loop-shaped cross-section which are connected to the web along laterally spaced, generally parallel lines. Fluid cementitious material pumped into containers in succession, so that adjacent containers overlap one upon another. Upon hardening, cementitious material which oozes through porous bag walls tends to bond the contacting walls together, thereby to provide an integrated mat-like protective cover of generally uniform, effective thickness.

3,786,641

MEANS FOR STABILIZING STRUCTURAL LAYER OVERLYING EARTH MATERIALS IN SITU

Lee A. Turzillo, 2078 Glengary Rd., Akron, Ohio

Division of Ser. No. 15,355, March 2, 1970, which is a division of Ser. No. 755,273, Aug. 26, 1968. This application Aug. 8, 1972, Ser. No. 278,844
Int. Cl. E02d *27/48*
U.S. Cl. 61—63 3 Claims



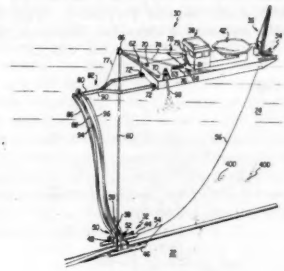
Method and means for providing solid columnar support under structural layer, overlying earth materials of an earth situs. Expansible agitator means projected through relatively small diameter hole in overlying layer and expanded to agitate and loosen earth materials to define elongated body thereof of greater peripheral size than hole. Self-hardenable fluid pumped through hole into loosened earth, is allowed to harden after removal of contracted agitator means through small hole. Resultant rigid, composite column underlies area of structural layer surrounding hole for the solid support of same.

3,786,642

METHOD AND APPARATUS FOR ENTRENCHING SUBMERGED ELONGATE STRUCTURES

Alan E. Good, and Delbert R. Ward, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed May 16, 1972, Ser. No. 253,895
Int. Cl. E02f *5/02*; B63b *35/04*
U.S. Cl. 61—72.4 25 Claims



A method and apparatus for entrenching submerged elongate structures within the bed of a body of water including a floating vessel, and at least one submergible vehicle connected to the floating vessel and operable to be lowered adjacent to a submerged elongate structure to be entrenched. The submergible vehicle includes a frame having a fore end and an aft end with a first primary and a first alternate cutting means connected to the frame and generally operably directed

toward the fore end thereof for cutting a trench within the water bed beneath the submerged elongate structure. Additionally, the submergible vehicle may be provided with a second primary and a second alternate cutting means connected to the frame and generally operably directed toward the aft end thereof for forming a trench within the water bed beneath the submerged elongate structure to be entrenched.

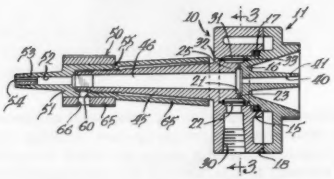
In one embodiment of the invention a motion compensation system is connected between the floating vessel and at least one submergible vehicle in order to minimize relative, sea induced, motion between the floating vessel and the submergible vehicle.

3,786,643

VORTEX TUBE

Richard T. Anderson, and Willard L. Andrist, both of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.

Filed Jan. 2, 1973, Ser. No. 320,649
Int. Cl. F25b 9/02
U.S. Cl. 62—5 **6 Claims**



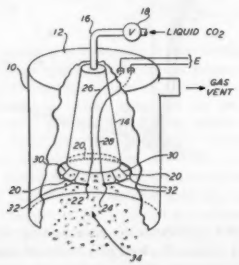
A vortex tube for converting pressure air to hot and cold air fractions and constructed of a body and cap assembled together with the cap and body forming a vortex chamber and a surrounding plenum chamber with a cold air passage extending outwardly from the cap and an elongate hot air passage extending outwardly of the body with the parts formed of plastic and shaped to provide a plug fit with each other and mounting an annular air filter screen therebetween and with a nozzle and valve unit threaded onto an end of the body providing for a plurality of control positions whereby either maximum cold air may be emitted from the unit or high temperature air can be emitted from the other end of the unit.

3,786,644

SYSTEM FOR CHANGING THE STATIC ELECTRICAL CHARGE ON CO_2 ICE PARTICLES

Harold T. Rich, Fullerton, and Torrence L. Wolf, Santa Ana, both of Calif., assignors to Airco, Inc., Montvale, N.J.

Filed June 2, 1972, Ser. No. 259,227
Int. Cl. F25j 1/00
U.S. Cl. 62—10 **4 Claims**



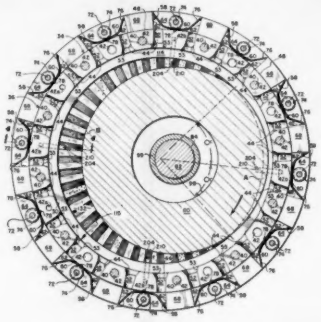
A CO_2 snow making machine comprising a snow horn into which liquid CO_2 is expanded for producing CO_2 snow, and an electrically energized conductor of general hoop shape spaced from and encircling the horn outlet.

3,786,645

APPARATUS FOR MAKING COMPACTED PELLETS OF SOLID PHASE CARBON DIOXIDE

Lyle L. Cann, Peotone, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Filed Aug. 28, 1972, Ser. No. 284,264
Int. Cl. B29c 3/00
U.S. Cl. 62—35 **19 Claims**



Apparatus for making compacted pellets of solid phase carbon dioxide comprises die means having radial extrusion passages therein, injector means for forming snow from liquid carbon dioxide flashed into an expansion zone adjacent the inlet end of said extrusion passages, compression means for compacting said snow and extruding the same outwardly through said passages to form elongated, rod-like extrusions of solid phase carbon dioxide, and back pressure means for exerting contact pressure against said extrusions leaving the outer ends of said passages in said die means.

A novel method in accordance with the present invention comprises the formation of compacted pellets of solid phase carbon dioxide from liquid phase carbon dioxide to form snow, compressing said snow to force the same through an extrusion passageway forming elongated, rod-like extrusions of compacted solid phase carbon dioxide and exerting back pressure against the rod-like extrusion as they leave the passageways thereby stabilizing the extrusions permitting the escape of gas without fracturing the same.

3,786,646

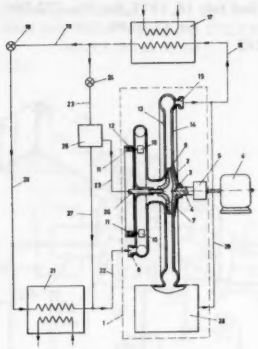
REFRIGERATING PLANT

Peter Jacobus Collet, Voorschoten, Netherlands, assignor to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer, The Hague, Netherlands

Filed Oct. 12, 1972, Ser. No. 297,090
Claims priority, application Netherlands, Oct. 13, 1971, 7114051
Int. Cl. F25b 1/04
U.S. Cl. 62—115 **4 Claims**

A refrigerating plant comprising a condenser, an evaporator and a centrifugal compressor having a rotor with radial or bent-backward solid vanes and further comprising means for controlling the head and volume-capacity of the compressor, wherein the compressor is a combination of a centrifugal compressor and a fluid vanes compressor, said solid vanes being provided with jet channels for forming liquid vanes said channels ending on the one side into slit-shaped orifices provided in the tips of the vanes and on the other side being connected to a central fluid supply provided with a flow-through control device and in operation below a pre-determined partial load of the plant, said flow-through control device is kept closed and the head and the volume-capacity of the compressor are controlled by means known per se for this purpose while operat-

ing above said pre-determined load said flow-through control device is adjusted in such a way that the head and volume-



capacity of the plant will meet the requirements between the higher range of said partial load and full load.

3,786,647

CENTRIFUGAL COMPRESSOR MELTER

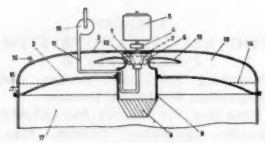
Peter Jacobus Collet, Voorschoten, Netherlands, assignor to Nederlandse Organisatie Voor Toegepast Natuurwetenschapelijk Onderzoek Ten Behoeve Van Niverheid, Handel En Verkeer, The Hague, Netherlands

Filed Aug. 7, 1972, Ser. No. 278,392

Claims priority, application Netherlands, Aug. 23, 1971, 11595

Int. Cl. B01d *9/04*

U.S. Cl. 62—123 **2 Claims**



In a device for the preparation of drinking-water out of brackish-water or salt-water, whereby the water is brought into contact with a cooling medium and the ice crystals are melted, the compressor and the melter-condenser vessel are combined into one unit, comprising a centrifugal fluid vanes compressor, the compressor chamber of which also forms the melting chamber and the fluid vanes are formed from a mixture of ice particles and a fluid which occurs in the process and which is fed to the jets.

3,786,648

COOLING SYSTEM WITH MULTIPLE EVAPORATORS

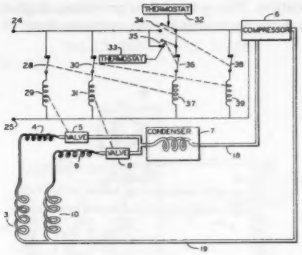
Milton J. Rice, Crete, Ill., assignor to General Electric Company, Indianapolis, Ind.

Filed Mar. 5, 1973, Ser. No. 338,095

Int. Cl. F25b *5/00*

U.S. Cl. 62—200 **5 Claims**

A cooling system for a refrigerator and a water cooler. A cabinet is provided with a refrigeration chamber having a first evaporator contained therein and a water cooler chamber having a second evaporator contained therein. The evaporators are connected to a single condenser and to first and second valves. The condenser and evaporators are further connected to a compressor. A control circuit is further pro-



vided for controlling the valves. The valves remain open while the compressor is off allowing the fluid pressure to equalize on either side of the compressor.

3,786,649

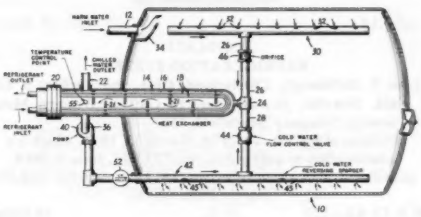
WATER CHILLER AND STORAGE SYSTEM

Robert F. Kirschner, Lakeville, Mass., assignor to The Patterson-Kelly Company, Inc., East Stroudsberg, Pa.

Continuation-in-part of Ser. No. 93,342, Nov. 27, 1970, Pat. No. 3,688,833. This application Aug. 2, 1972, Ser. No. 277,271

Int. Cl. F25d *17/02*

U.S. Cl. 62—201 **26 Claims**



A dual mode operative water chilling and storage system for supplying "chilled" or cooled water or the like under both normal and peak demand conditions. The system includes a chilled water storage tank having a water supply inlet for replenishing water withdrawn from the tank, a conduit system including means for forcibly circulating water from a higher region to a lower region of the tank and including means for cooling the circulating water; means connected into the system for withdrawing chilled water up to a given rate of flow which is in excess of the rate at which water is normally circulated through the conduit system; and normally closed means for connecting the lower region of the tank in flow communication with the withdrawal means whenever the withdrawal rate exceeds the normal circulation rate to supplement the normal delivery rate of the system.

3,786,650

AIR CONDITIONING CONTROL SYSTEM

Alwin B. Newton, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

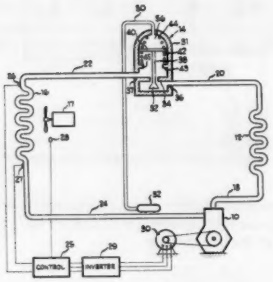
Filed July 7, 1972, Ser. No. 269,636

Int. Cl. F25b *41/00*

U.S. Cl. 62—209 **1 Claim**

A refrigerant control system, particularly useful for air conditioning apparatus, including means for operating the system with a relatively high evaporator pressure during the time the temperature within the cooled space is being reduced to its

desired level. While such temperature level is being reduced, a constant pressure expansion device is adjusted to maintain the control point at a lower temperature (and pressure) to effect dehumidification. This system thus provides a higher capacity during pull-down by modifying the response level of an automatic expansion device until pull-down is achieved. Until either a reduced suction line temperature or a reduced ambient temperature (or both) is attained, the setting of the valve is higher than normal thus increasing the capacity required of the compressor for a given superheat level.



3,786,651

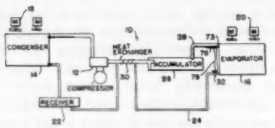
REFRIGERATION SYSTEM

John T. Eschbaugh, Chesterland, Ohio, and Herbert S. Lindahl, Danville, Ill., assignors to Gulf & Western Metals Farming Company, Southfield, Mich.

Division of Ser. No. 127,174, March 23, 1971, which is a continuation-in-part of Ser. No. 773,946, June 3, 1968, abandoned. This application Nov. 19, 1971, Ser. No. 200,474

Int. Cl. F25b *41/06*

U.S. Cl. 62—222 **10 Claims**



A refrigeration system has the system condenser exposed to the normal outdoor ambient temperature. The control means includes a single balanced expansion valve having a maximum port opening which is oversized as compared to that required only for normal summer operation, and the valve is actuated to provide a much larger increase in port opening under winter conditions than have heretofore been used. The result is that the system operates without adjustment or modification over an exceptionally wide range of condenser ambient temperature. The balanced valve is actuated by motor means responsive to evaporator outlet temperature and an evaporator pressure condition such as inlet or outlet pressure. The valve element may be slightly over or under balanced to provide predetermined operating characteristics.

3,786,652

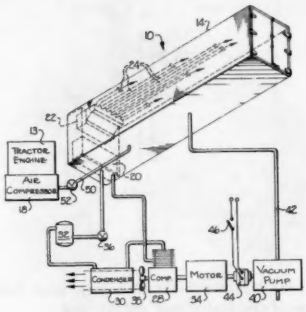
REFRIGERATING APPARATUS

Andrew T. Bolynn, P.O. Box 8112, Charlotte, N.C.

Filed July 18, 1972, Ser. No. 272,786

Int. Cl. B60h *3/04*

U.S. Cl. 62—243 **5 Claims**



A refrigerating apparatus for conditioning an enclosed space such as a truck trailer body and including means for selectively drawing a partial vacuum within the space such that perishable food products may be rapidly cooled by vaporizing the moisture thereon, and means for selectively pressurizing the space to prevent dehydration of the food products during relatively long term storage.

3,786,653

ABSORPTION REFRIGERATION SYSTEM OF THE INERT GAS TYPE

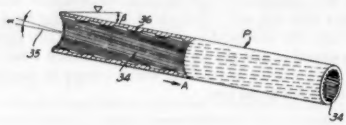
Peter Erik Blomberg, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Mar. 9, 1971, Ser. No. 122,413

Claims priority, application Sweden, Mar. 10, 1970, 3152/70

Int. Cl. F25b *15/10*

U.S. Cl. 62—491 **10 Claims**

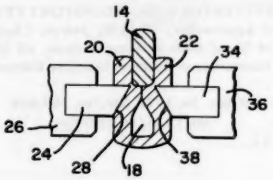


Liquid flows in the presence of an inert gas in heat transfer members, such as the evaporator and absorber, of an inert gas circuit of absorption refrigeration apparatus. The heat transfer members are formed by piping which slopes downward and is inclined at an acute angle to the horizontal and has a plurality of internal longitudinal capillary grooves. The grooves are helical and at an acute angle to the generatrix or slope of the piping which is less than the acute angle at which the piping is inclined to the horizontal.

3,786,654
LATCH SEAT FOR KNITTING NEEDLE

John J. Sgrillo, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed July 18, 1972, Ser. No. 272,730
Int. Cl. D04b 35/04
U.S. Cl. 66—121 2 Claims

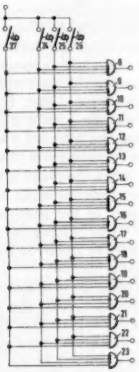


The latch seat is formed by displacing laterally inwardly into the latch slot a portion of one side or a portion of both sides of the blade.

3,786,655
CONTROL ARRANGEMENT FOR A FLAT KNITTING MACHINE

Erich Krause, Bopfingen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed Mar. 3, 1971, Ser. No. 120,628
Int. Cl. D04b 15/66
U.S. Cl. 66—154 A 4 Claims

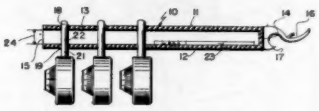


A multiplicity of electrically actuated operating elements in a flat knitting machine is controlled by punched cards having only a limited number of tracks and a corresponding reading station in which sensing switches generate control signals in response to card movement. A system of logic elements is arranged in a circuit between the sensing switches and the operating elements in such a manner that control signals generated by the relatively few switches cause an entire group of operating elements, more numerous than the sensing switches, to be actuated either simultaneously or in timed sequence.

3,786,656
IGNITION KEY STORAGE DEVICE

Wasyl Suprowich, Box 16, Group 200, R.R. No. 2, Selkirk, Manitoba, Canada

Filed Dec. 11, 1972, Ser. No. 313,774
Int. Cl. E05b 65/52, 73/00
U.S. Cl. 70—63 2 Claims

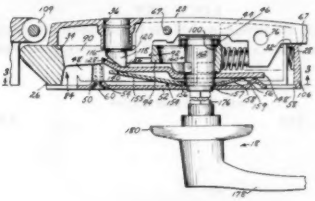


A container receives the key and a plurality of combination locks close off the container and prevents the key from being removed until all of the locks are unlocked and removed. Due to the concentration and manipulation required, this prevents an intoxicated driver from obtaining access to the ignition key of his vehicle.

3,786,657
SLAM-STYLE SAFETY LOCK

Frank F. Loikitz, Middletown, N.J., assignor to Instrument Systems Corporation, Jericho, N.Y.

Filed Jan. 12, 1972, Ser. No. 217,148
Int. Cl. E05b 65/06
U.S. Cl. 70—150 8 Claims



A slam-style safety lock for industrial refrigerated walk-in compartments, truck bodies, and self-sealing environmental rooms, to allow egress from the interior when the lock is secured on the outside. The lock bolt is retractable, being actuated by a pivotal handle in the well known manner, and the bolt has a centrally positioned aperture in which is positioned a cam hub which engages a shoulder at the rear of the bolt, the shoulder acting as a cam follower.

The forward portion of the bolt has a rear lip under which is positioned a forwardly extending metal locking plate, also having a shoulder positioned just forwardly of the front surface of the cam hub. Positioned under the plate is a leaf spring maintaining constant pressure on the locking plate to actuate a drop action when locking is required.

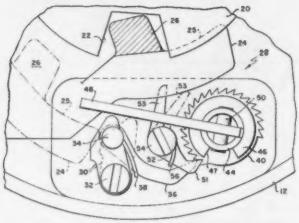
In an unlocked position the plate is depressed inwardly so that the bolt passes along the plate without contacting it. When the lock is in a secured position rearward movement of the bolt will cause the forward portion of the plate to engage the lip on the bolt. If the cam hub is actuated from within, upon rotation, the forward surface of the hub will strike the shoulder of the plate, causing the plate to be depressed inwardly, and allowing the bolt to move rearwardly

3,786,658

RESTRICTIVE MANIPULATION LIMITED TRY MECHANISM FOR A COMBINATION LOCK

Frank H. Swaim, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 23, 1972, Ser. No. 265,930
Int. Cl. E05b *37/08*
U.S. Cl. 70—333 R **12 Claims**



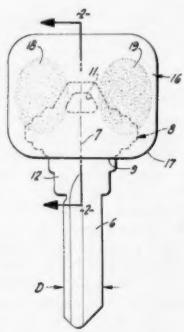
A combination lock having a restrictive manipulation or limited-try feature to prevent the opening of the lock by trial and error manipulation. The mechanism recognizes and counts each unsuccessful attempt at finding the proper code. After a predetermined number of unsuccessful attempts to open the lock, the mechanism renders the lock unopenable, without the knowledge of the illicit manipulator but will continue to accept additional manipulations. A registering device, associated with the mechanism, will reset to permit the opening of the lock by the owner only when the proper code is dialed before the predetermined number of unsuccessful attempts has been reached.

3,786,659

LOCK KEY

George Elder, Woodside, and Hans F. Lehnhoff, Moraga, both of Calif., assignors to Schlage Lock Company, San Francisco, Calif.

Filed Nov. 15, 1972, Ser. No. 306,695
Int. Cl. E05b *19/04*
U.S. Cl. 70—395 **5 Claims**



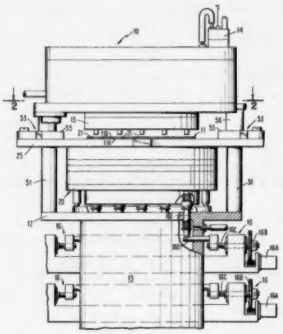
A lock key having a shank elongated along an axis and having a predetermined width also has a substantially flat bow integral with the shank and extending laterally thereof for a much greater width to provide extensions on opposite sides of the shank axis. A hard, integral, non-frangible turning pad is preferably molded in intimate contact with the bow and extends out from the margins of the bow to encase the bow except at the junction of the bow with the shank. The pad furnishes spaced torque zones that are supported by the encased bow to resist yielding of the extended turning pad under torque.

3,786,660

WAFER INTERLOCKING TRANSPORT SYSTEM

Henry Albert Appenzeller, Wallkill; Joseph Charles Miller, and Vincent Shea, both of Poughkeepsie, all of N.Y., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Nov. 24, 1972, Ser. No. 309,408
Int. Cl. B21d *26/00*
U.S. Cl. 72—12 **15 Claims**



A wafer transport apparatus to lock and hold a wafer in a predetermined contoured position while permitting transport of the wafer from the contouring apparatus to a remote location for further processing on the contoured wafer surface. The apparatus comprises a pallet having a plurality of pedestals therein, and vacuum cups at one extended end of the pedestals for supporting and gripping a wafer thereon. Means are provided to permit reciprocation of individual ones of the pedestals in the pallet, when the pallet is positioned in the contouring apparatus, and pedestal locks are provided to grasp and lock individual ones of the pedestals in an individually determinable position, while holding the pedestals in that position so that the pallet may be removed from the apparatus and positioned at some remote station.

The purpose of this abstract is to enable the public and the Patent Office to determine rapidly the subject matter of the technical disclosure of the application. This abstract is neither intended to define the invention of the application nor is it intended to be limiting as to the scope thereof.

3,786,661

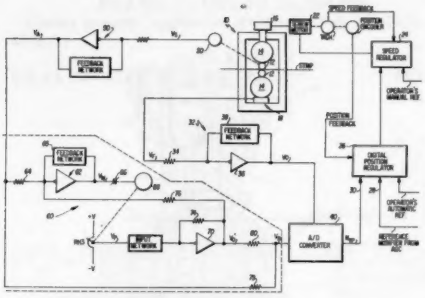
ROLLING MILL CONTROL SYSTEM

James D. McKee, and John F. Lamb, both of Florence, Ala., assignors to Reynolds Metals Company, Richmond, Va.

Filed Apr. 12, 1972, Ser. No. 243,130
Int. Cl. B21b *37/00*
U.S. Cl. 72—19 **12 Claims**

A rolling mill and associated control system are described, including means for adjusting roll spacing of the mill to keep

the exit gage of rolled strip substantially constant as the mill is accelerated to normal operating speed; the adjusting means



being operable selectively over a range of mill speeds to cause roll spacing adjustments in relation to subsequent changes in mill speed.

3,786,662

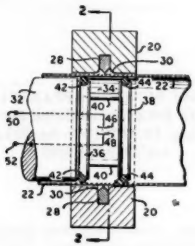
ELECTROPNEUMATIC OR ELECTROHYDRAULIC CUTOFF, FLANGING AND RE-FORMING OF TUBING

Donald J. Roth, Chicago Heights, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 441,017, March 19, 1965, abandoned. This application Aug. 31, 1970, Ser. No. 68,505

Int. Cl. B21d *28/18*

U.S. Cl. 72—55 **10 Claims**



Disclosed herein is apparatus and method for the electropneumatic or electrohydraulic severing, flanging, re-forming and the like of members such as, for examples, container bodies and the like. The force generated for performing these operations is created through the application of electrical energy to a pair of electrodes positioned within a chamber to provide an electrical discharge within such chamber. The electrical discharge creates a plasma bubble between the electrodes and such bubble continues to grow as continued power is supplied to the electrodes. The force so created drives the wall of the member or workpiece against an adjacent die to perform the desired operation or operations.

3,786,663

BENDING TOOL

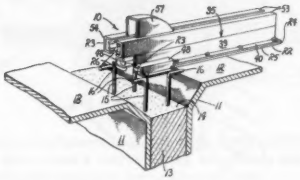
Michael J. Molnar, Selma, Calif., assignor to ABC Bending Enterprises, Fresno, Calif.

Filed Feb. 25, 1972, Ser. No. 229,313

Int. Cl. B21d *7/02*

U.S. Cl. 72—220 **14 Claims**

A tool for bending rods and the like having a frame, a mandrel mounted in the frame and adapted to be positioned in contact with such a rod, a pair of cooperative grasping latches mounted in the frame and operable to secure the rod in contact with the mandrel, a pair of juxtaposed guide rails provided in the frame on opposite sides of the mandrel, a pair of arms mounted in the rails for reciprocal movement toward and from the mandrel for controlled spaced adjustment by said



movement, a forming member having separable portions individually mounted on the arms, said portions being adapted to pass on opposite sides of the rod held by the latches in movement of the arms from the mandrel and being brought together and engaged with the rod in movement of the arms toward the mandrel, and a ram operatively interconnecting the arms and the latches.

3,786,664

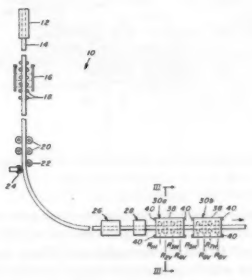
ROLLING MILL MODULE

Donald A. Jones, Bethel Park; Howard S. Orr, Upper St. Clair Township, Allegheny County, and Francis K. Qualey, Churchill, all of Pa., assignors to United States Steel Corporation

Filed Mar. 20, 1972, Ser. No. 235,992

Int. Cl. B21b *13/08*

U.S. Cl. 72—234 **23 Claims**



A rolling mill module for a rolling mill for rolling a billet is disclosed. The rolling mill module has a frame, a first pair of rolls journalled in the frame, and a second pair of rolls journalled in the frame and spaced a predetermined distance from the first pair of rolls so that the temperature drop in the billet between the first pair of rolls and the second pair of rolls is minimized. The rolling mill module is adapted to be readily removed from the rolling mill for repairs or replacement.

3,786,665

HOT EXTRUSION MACHINE

Robert Armand Creuzet, Route de Beyssac, Marmande, France

Filed Feb. 16, 1972, Ser. No. 226,829

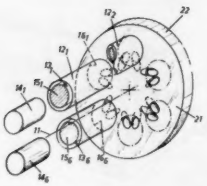
Claims priority, application France, Mar. 26, 1971, 7110820

Int. Cl. B21c *23/00*

U.S. Cl. 72—259 **10 Claims**

A machine for producing metal tubes by hot extrusion of billets. The machine has an annular extrusion gap, a plurality

of containers for receiving billets which are uniformly angularly spaced about the extrusion gap and grooves or conduits formed in an annular plate of progressively diminishing cross section towards the annular gap for channeling metal from the billets as associated extrusion pistons exert pressure on the ends of the billets remote from the extrusion gap, the grooves or conduits being delimited by an extrusion needle arranged coaxially of the extrusion gap.



3,786,666

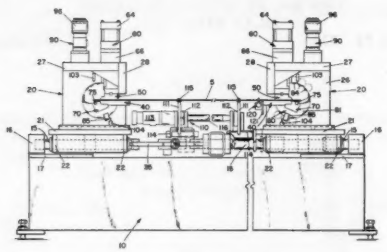
METAL BENDING MACHINE

John J. York, Jr., Walker, Mich., assignor to Schiefler Tool & Engineering, Inc., Grand Rapids, Mich.

Filed Aug. 4, 1971, Ser. No. 168,871

Int. Cl. B21d *11/04, 43/00*

U.S. Cl. 72—305 **18 Claims**



The bending apparatus includes a pair of supports mounted on a frame, each support including means for bending a sheet of metal supported between the supports. Each support includes a bed upon which a sheet of metal can be laid and a mandrel mounted on a clamping press which can be clamped onto the top of a sheet of metal lying on the bed. The face of the mandrel has a cross-sectional configuration corresponding to the configuration desired for the metal to be bent. A bending wing, having a configuration which will matingly abut the face of the mandrel, is mounted adjacent the bed on a rotatable carriage assembly. A pivot drive assembly acts to rotate the carriage assembly and pivot the wing into a sheet of metal, thereby bending the sheet of metal on the mandrel.

3,786,667

APPARATUS FOR AND METHOD OF MAKING A NESTABLE CONTAINER

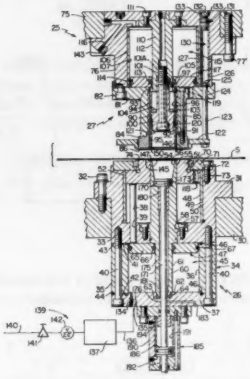
Eubank W. Garnett, Jr., Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Oct. 26, 1971, Ser. No. 192,177

Int. Cl. B21d *22/24*

U.S. Cl. 72—348 **6 Claims**

An improved apparatus for and method of making a nestable container are provided wherein a flat blank is drawn to define a drawn container which is reverse redrawn to form the nestable container which has a side wall and an annular planar flange extending therefrom with a toroidal bead extending from the flange and having at least a portion thereof arranged within and beneath the peripheral edge of the flange. The apparatus comprises a die set having integral fluid cushion means of simple construction which controls the movements of cooperating dies during both the drawing and reverse redrawing action.



3,786,668

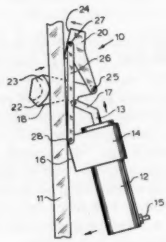
CABLE BENDING APPARATUS

Silas Ray Crees, P.O. Box 813, Eau Gallie, Fla.

Filed Aug. 18, 1972, Ser. No. 281,817

Int. Cl. B21d *9/05*

U.S. Cl. 72—388 **10 Claims**



A wire bending apparatus for bending electrical cables, or the like, in narrow confines such as panel boxes. The apparatus is connected to an electrical conductor by placing three separate wire engaging members, each of which is connected to a hydraulic cylinder, against the wire, and actuating the hydraulic cylinder to bring the wire-engaging members into engagement onto the wire. Continued actuation of the hydraulic cylinder then bends the wire to any desired bend.

3,786,669

HYDRAULIC JOINTING PRESS

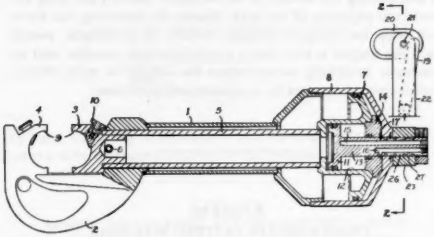
Raydon A. Lines, Elizabeth West, Australia, assignor to Proline Industries Pty. Ltd., Elizabeth West, Australia

Filed May 17, 1972, Ser. No. 254,298

Claims priority, application Australia, May 19, 1971, PA 4935/71

Int. Cl. B21j 9/12

U.S. Cl. 72—453 5 Claims



A hydraulic jointing press having a housing with jaws at one end thereof. The other end is expanded to house a large diameter piston to apply the jointing pressure, the large piston having a smaller piston therein to return the main piston.

3,786,670

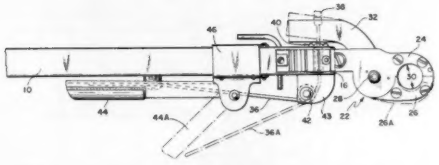
WIRE GRIPPING TOOL

Charles J. McGlothlin, Rt. 1, Box 198 Madison Height, Madison Heights, Va.

Filed Apr. 13, 1972, Ser. No. 243,716

Int. Cl. B25b 7/04

U.S. Cl. 72—480 6 Claims



A wire gripping tool particularly adapted to grip and facilitate for bending and the like of large electric wires when wiring switch boxes, fuse boxes or the like, having a head including wire gripping jaws actuatable to gripping position by a lever controlled cable, the head and wire gripping jaws being pivotally mounted on a handle to be turned angularly with respect to the axis of the handle, and controllable ratchet means selectively permitting angular turning and locking of the head and jaws.

3,786,671

VEHICLE VACUUM CHAMBER LEAK TESTING DEVICE

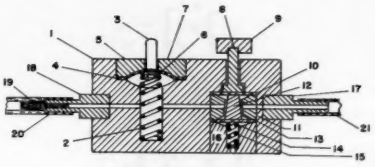
Joseph Adalbert Caron, 1170, 9th St., Box 341, Grand Mere, Quebec, Canada

Filed Feb. 3, 1972, Ser. No. 223,066

Int. Cl. G01m 3/02

U.S. Cl. 73—40 4 Claims

A mannually operated vacuum device, particularly adapted to use the engine running vacuum to detect the leaks in a vacuum chamber of ignition distributors, automatic transmission, heater controls antipolution devices, etc.; without removal thereof from the vehicle. The device includes an operation mechanism and a leak indication mechanism connected by a main passage arranged to connect the engine intake manifold to the vacuum chamber to be checked. The operating mechanism includes a valve along said main passage and a button to selectively open and close the valve. The leak



indication mechanism includes diaphragm, and indicator fixed to the latter, and a return spring whereby a leak will be indicated by the displacement of the indicator.

3,786,672

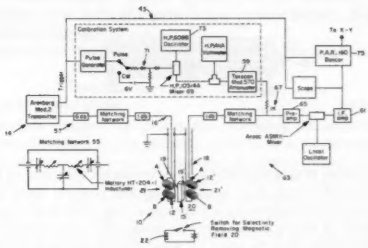
TWO-DIMENSIONAL COILS FOR ELECTRO-MAGNETIC GENERATION AND DETECTION OF ACOUSTIC WAVES

Martin R. Gaerttner, Ithaca, N.Y., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 20, 1972, Ser. No. 290,684

Int. Cl. G01n 29/04

U.S. Cl. 73—67.5 R 6 Claims



Apparatus and method for producing and detecting magnetic and non-magnetic acoustic waves in a conductive body, wherein the waves are generated electromagnetically by a constant amplitude wave front transmitted to a surface of the body by a two-dimensional, flat, spirally wound coil in a plane parallel to and spaced from the conductive surface, and like coil means or a quartz transducer are used for detection. Specific transducers having dual, race-track shaped, two-dimensional coils are described for selectively generating and detecting magnetic directly generated acoustic waves when the body is immersed in a magnetic field, and non-magnetic directly generated acoustic waves when the magnetic field is reduced or removed entirely. A single spiral, two-dimensional coil, is also used for selectively producing and/or detecting the non-magnetically generated acoustic waves.

3,786,673

DETERMINATION OF MECHANICAL DESIGN PROPERTIES OF ELASTIC MATERIALS

Gerd Friedrich Horst Weissmann, Florham Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

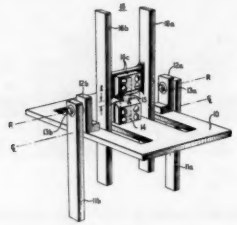
Filed Mar. 15, 1972, Ser. No. 234,781

Int. Cl. G01m 7/00; G01n 3/38

U.S. Cl. 73—67.2 7 Claims

Mechanical design properties of elastic materials including design stress and design modulus are determined from the energy dissipation per cycle and total elastic energy of a sam-

ple used as a spring in a one degree of freedom oscillator whose fixed end is subjected to a transient displacement dur-



ing each cycle. The energy dissipation per cycle and total elastic energy are related to the steady state amplitude and frequency, respectively, of the oscillator.

3,786,674

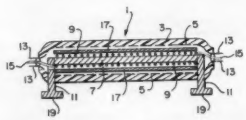
COAXIAL MAGNETOSTRICTIVE ACCELEROMETER

Romans Skujins, Jr., Clifton, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 6, 1972, Ser. No. 286,804

Int. Cl. G01h *1/00*; **G01p** *15/00*; **G08b** *13/00*

U.S. Cl. 73—71.4 **2 Claims**



A coaxial magnetostrictive accelerometer designed to sense mechanical vibration or acceleration and convert these vibrations or accelerations to a corresponding electrical signal is disclosed. A single accelerometer designed in accordance with this invention may be used to sense vibrations and accelerations or a very large number of accelerometers of this invention may be connected in series by sections of coaxial cable and used with single channel electronic sensing and measuring devices.

3,786,675

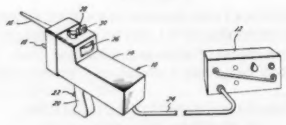
PORTABLE GAS LEAK DETECTOR

Leroy C. Delatorre, Spring, and William J. Rapson, Houston, both of Tex., assignors to Uson Corporation, Houston, Tex.

Filed Nov. 23, 1970, Ser. No. 92,035

Int. Cl. G01n *31/00*

U.S. Cl. 73—27 R **8 Claims**



In a portable gas leak detector for determining the location of leaks of gases having a different thermal conductivity than the ambient surroundings and having a conductivity detector, first amplifier and output, the improvement of a positive and a negative drive amplifier connected to the first amplifier with separate indicating lights connected to each of the positive and negative drive amplifiers for indicating the relative conductivity of the sample to the ambient surroundings and whether the detector is approaching or leaving a leak. A feedback loop connected across the first amplifier which includes an amplifier having a memory retaining means for zeroing the output for overcoming temperature induced drift in the detector and nulling the output of the detector thereby allowing accurate pin-pointing of the leak. Means for actuating the feedback loop including a manual switch, an automatic switch when the output is less than a predetermined amount, and an automatic switching means when the output is more than a predetermined amount for a certain period of time.

3,786,676

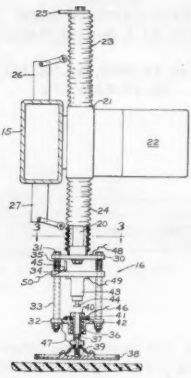
COMPRESSION TESTING MACHINE

Russell T. Korolyshun, Derby, and P. Mark Rehnborg, Bethany, both of Conn., assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 18, 1972, Ser. No. 298,567

Int. Cl. G01n *3/00*

U.S. Cl. 73—94 **10 Claims**



A machine for automatically carrying out an indentation load deflection test on cushioning material such as latex foam rubber mattresses and cushions deposits a foot plate on the article being tested, stores an electric signal indicating thickness, utilizes the signal to advance the foot plate until a null point is reached at the predetermined percentage of compression, reads and displays the compressive force, and retracts from the article.

3,786,677

APPARATUS FOR TESTING SWAGED FERRULES

Leonard P. Spontelli, Seven Hills, Ohio, assignor to Crawford Fitting Company, Solon, Ohio

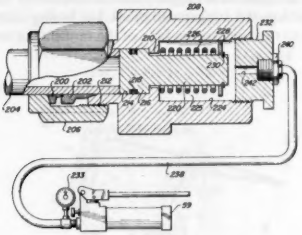
Division of Ser. No. 134,229, April 15, 1971. This application Nov. 20, 1972, Ser. No. 308,258

Int. Cl. G01l *5/00*; **G01n** *3/10*

U.S. Cl. 73—88 B **3 Claims**

Apparatus for testing the swaging of one or more ferrules on the periphery of a cylindrical member such as a tube. The ap-

paratus shown in the drawings includes means for applying a predetermined longitudinally directed force against an end of



the tube while the ferrules are held to determine whether or not the tube will move relative to the ferrules.

3,786,678

FORCE MEASURING APPARATUS INCLUDING ELECTROMAGNETIC LOAD COMPENSATION

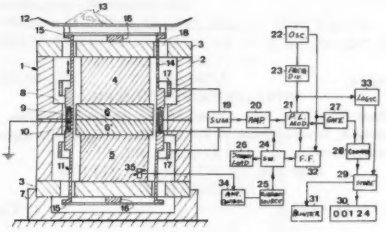
Peter Kunz, Meilen, Switzerland, assignor to Mettler Instrumente, AG, Zurich, Switzerland

Filed Feb. 2, 1972, Ser. No. 222,960

Claims priority, application Switzerland, Apr. 5, 1971, 5006/71

Int. Cl. G01l *1/08*

U.S. Cl. 73—141 R **10 Claims**



Force measuring apparatus of the type including electromagnetic load compensation means for returning a load-responsive movable member to its initial no-load position relative to a housing. Load compensating pulses of constant amplitude are supplied to a load compensating coil that is connected with the movable member, the length of said pulses being varied as a function of the extent of the displacement of the movable member from its initial position as determined by position sensing means. The invention is characterized by the provision of means for supplying high frequency pulses from an oscillator to a counter only during periods corresponding with the length of said load compensating current pulses.

3,786,679

FATIGUE INDICATION

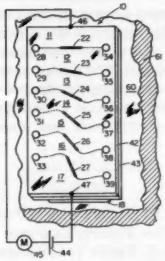
Nelson A. Crites, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Apr. 12, 1972, Ser. No. 243,225

Int. Cl. G01l *1/22*; **G01b** *7/18*

U.S. Cl. 73—88.5 R **21 Claims**

A device for indicating accumulated fatigue in a selected portion of a structural member. An elongate electrically conductive foil coupon has crack initiating slots of different sizes or shapes, or oriented at different angles, in regions that crack in response to fatigue and thus increase the electrical resistance between selected points. An adhesive securely bonds the coupon to the selected portion of the structural member, transmitting any strain therein to the coupon, which cracks at a lower level of accumulated fatigue than is enough to crack



the structural member in the selected portion. Means responsive to the electrical resistance between the selected points on the coupon provide warning indications in time to avoid rupture of the structural member.

3,786,680

VOLTAGE SENSING SYSTEM

Derek Gerald Wyatt, Oxford; Delia Margaret Clark, Almondsbury, and Michael Anthony Warne, Brewood, all of England, assignors to Marston Excelsior Limited, Wolverhampton, Staffordshire; Derek Gerald Wyatt, Oxford, Oxfordshire and Delia Margaret Clark, Almondsbury, Somerset, all of, England

Division of Ser. No. 144,292, May 17, 1971. This application Nov. 1, 1972, Ser. No. 302,676

Int. Cl. G01f *1/00*; **A61b** *5/02*

U.S. Cl. 73—194 EM **9 Claims**

A system comprising means for providing an alternating magnetic field in a liquid phase so as to induce an alternating voltage therein, and a pair of contact electrodes positioned at right angles to the field to sense the alternating voltage thus induced, each of the electrodes being an electrode comprising a substrate body of a metal selected from the group consisting of gold, platinum and alloys thereof, with at least one coating of a precious metal or alloy fired on at least part of the surface of the body from a paint containing the precious metal or alloy, the electrode being characterized by its low impedance to the passage of alternating current even after repeated autoclaving in steam.

3,786,681

ELECTROMAGNETIC WAVE MODULATION AND MEASUREMENT SYSTEM AND METHOD

Robert M. Kiehn, Luling, Tex., assignor to SCI Systems, Inc., Huntsville, Ala.

Filed Mar. 4, 1971, Ser. No. 121,101

Int. Cl. G01p *15/08*; **G01v** *7/12*

U.S. Cl. 73—382 **11 Claims**

Electromagnetic waves with multiple polarization and/or propagation direction modes, preferably in the form of laser waves, are modulated by means of force-responsive devices such as amorphous quartz elements. The application of force or acceleration to the modulator creates a difference in frequency of two of the modes. That frequency difference is a

function of the force or acceleration being measured. The two signals are combined and their difference is detected in a beat detector. In a preferred embodiment, the electromagnetic waves are developed in a ring laser operating with plural circular polarization modes. Preferably, each polarization mode exists in one of the counter-directional laser beams. The modulator is a quartz cylinder located in the laser cavity. The force is applied in the form of a torque tending to twist the cylinder about its longitudinal axis. The device provides a high degree of sensitivity and a wide range in the measurement of force and acceleration. The invention is described as it is used in gravimeters, pressure altimeters and pressure measurement devices.

3,786,682

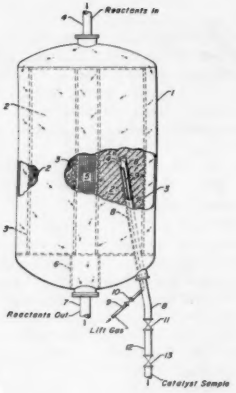
CATALYST SAMPLING APPARATUS

George R. Winter, Des Plaines; Laurence O. Stine, Western Springs, and John E. Vande Ven, Bensenville, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 22, 1972, Ser. No. 317,870

Int. Cl. G01n *1/14*

U.S. Cl. 73—421 B **8 Claims**



Catalyst is withdrawn from an operating high pressure reactor through a tube extending into the catalyst bed from a blocked off sample receiver. The large diameter tube contains a small diameter line which delivers a gas stream of such high velocity that it acts as a valve to prevent catalyst from entering the opening in the larger tube. A temporary reduction in the gas flow allows catalyst to fall into the large tube, through which it falls by gravity to the receiver. The end of the gas line is preferably near the opening in the catalyst withdrawal tube.

3,786,683

HAND-OPERATED PIPETTE

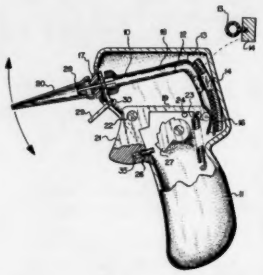
Richard M. Berman, Dresher, Pa., and Bernard Schwartz, Springfield, N.J., assignors to Alphamedics Mfg. Corp., Levittown, Pa.

Filed Sept. 12, 1972, Ser. No. 288,266

Int. Cl. G01n *1/10*; A63h *3/18*; F04b *43/08*

U.S. Cl. 73—425.4 P **10 Claims**

A hand-operated portable pipette is disclosed which includes a housing, a flexible tube mounted therein along a path. The tube has a first end thereof mounted for movement with respect to the housing. A trigger is also mounted on the housing to operate a roller for occluding the tube along a portion of the path in response to movement of the trigger. The trigger is biased to a rest position. A multifaced cam is mounted as an adjustable stop for determining the nominal maximum travel of the trigger. A spring loaded over-travel stop is mounted in the trigger to interact with the multifaced cam so that a first force applied to the trigger will cause the spring loaded over-travel stop to rest against the face of the multifaced cam bring-



ing the trigger to rest at a first position. If additional force is applied to the trigger, the spring loaded over-travel stop depresses into the trigger extending the movement of the trigger to allow the tube to be occluded further along the path. A disposable tip is inserted in a movable end of the tube to allow changing thereof. A second trigger, arm, and sleeve are used to eject the disposable tip after usage.

3,786,684

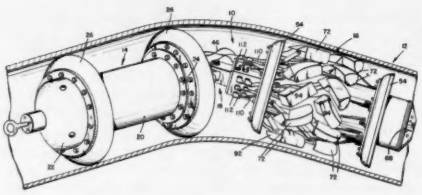
PIPELINE INSPECTION PIG

William C. Wiers, Ann Arbor, Mich.; James R. Sullins, and David A. Warren, both of Tulsa, Okla., assignors to Automation Industries, Inc., Los Angeles, Calif.

Filed Dec. 27, 1971, Ser. No. 211,910

Int. Cl. G01r *3/12*

U.S. Cl. 73—432 R **17 Claims**



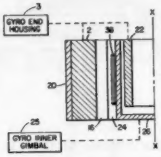
A self-contained, fully instrumented pipeline inspection pig is disclosed herein. The pig is particularly adapted to be (1) placed in a cross-country or transmission pipeline at a first location such as a pumping station, (2) carried a long distance through the pipeline by the products being pumped therethrough, and (3) eventually retrieved at a second location such as a subsequent pumping station. The pig includes an assortment of instruments for scanning the inside of the pipeline as it is being carried therethrough. These instruments detect various types of discontinuities such as cracks and other defects in the wall of the pipeline. The results of the inspection are stored in an onboard recorder carried by the pig whereby the results can be analyzed after the pig has traversed the pipeline and has been removed therefrom.

3,786,685

COMBINATION PERMANENT MAGNET TORQUER-EDDY CURRENT DAMPER FOR A GYRO

Ernest E. Lademann, Park Ridge, and Ralph E. Iadarola, Roseland, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Sept. 28, 1971, Ser. No. 184,544
Int. Cl. G01c 19/04
U.S. Cl. 74—5.5 3 Claims



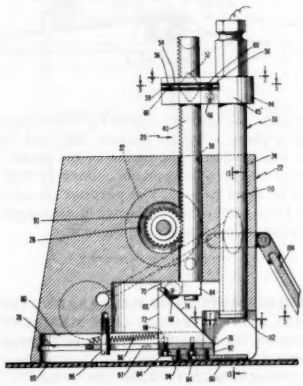
A permanent magnet torquer-eddy current damper for a gyro includes a copper cylinder supported for rotating with the gyro inner gimbal and a coil assembly mounted on the cylinder. The cylinder is disposed in the magnetic field and relative motion between the field and cylinder is damped to induce currents while torquing is provided through current in the coil assembly. Temperature compensating means are provided for damping and torquing stability.

3,786,686

SUPPORTING DEVICE

William D. Hay, Peekskill, N.Y., assignor to Unit Process Assemblies, Inc., Woodside, N.Y.

Division of Ser. No. 141,496, May 10, 1971, Pat. No. 3,720,833. This application Mar. 22, 1972, Ser. No. 237,213
Int. Cl. F16h 19/04
U.S. Cl. 74—33 3 Claims



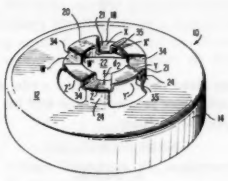
A radiation backscatter measuring instrument is provided for use with a portable probe assembly having an elongated casing with an opening at one end thereof and containing a radiation source positioned in predetermined relation therewith and a radiation detector for detecting radiation backscattered from a workpiece exposed to radiation from the source through the casing opening. The radiation backscatter measuring instrument includes a planar, horizontally disposed, transparent locator with a series of guide lines on the bottom surface thereof which is positioned over the selected locus of measurement on the horizontally supported workpiece. The locator, is then horizontally retracted from its locating position while the portable probe is vertically lowered to engage the workpiece with the opening thereof being positioned over the selected portion of the workpiece to be tested.

3,786,687

UNITIZED CLUTCH DRUM AND SPROCKET

William Lavier Gasner, Carson, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Nov. 7, 1972, Ser. No. 304,313
Int. Cl. F16h 55/30
U.S. Cl. 74—243 CS 7 Claims



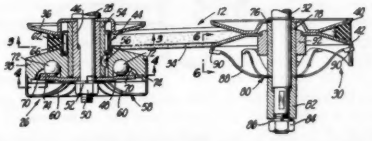
A unitized clutch drum and coaxially aligned chain driving sprocket and a method of fabrication thereof from a single blank is provided. An outside cylindrical wall of an apertured blank is stamped to form a clutch drum friction face. An interior portion of the blank is stamped a first time to form a cup-shaped depression which extends oppositely from the cylindrical wall. This cup-shaped depression is supported by webs intermediate the apertures in the blank. This interior portion of the blank is stamped a second time to form a set of oppositely facing tang receiving pockets which set comprises the sprocket portion of the unit.

3,786,688

VARIABLE RATIO BELT-TYPE TRANSMISSION HAVING IMPROVED DRIVEN PULLEY

Bert N. Svenson, Downey, Calif., assignor to Instrument Systems Corporation, Jericho, N.Y.

Division of Ser. No. 150,523, June 7, 1971. This application Apr. 16, 1973, Ser. No. 351,474
Int. Cl. F16h 55/52
U.S. Cl. 74—230.17 M 21 Claims



A variable ratio belt-type transmission. The transmission transmits power from a driving shaft of the engine to a driven shaft of the cycle when the engine is running, and transmits pedal-generated power from the driven shaft to the driving shaft to start the engine when it is not running.

3,786,689

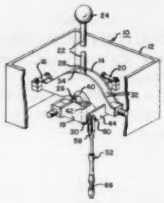
SINGLE LEVER JOY-STICK APPARATUS

Richard D. Houk, Stow, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1972, Ser. No. 278,789
Int. Cl. G05g 9/02
U.S. Cl. 74—471 XY 9 Claims

A single lever joy-stick apparatus comprising a housing, first and second slotted motion transmitting members pivotally mounted in said housing such that their respective pivot axes perpendicularly intersect, a joy-stick having a spherical ball attached to its shaft, portions of said shaft of said joy-stick engaging said motion transmitting members at bearing surfaces

defined by said slots, each of said motion transmitting members having oppositely disposed substantially concave bearing surfaces intermediate their respective ends, mating with the convex outer surface of said spherical ball for supporting said ball in its operational position.



3,786,690

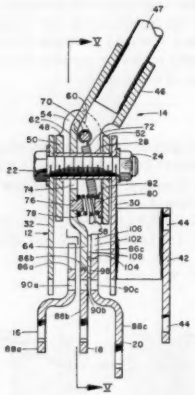
LIFT GATE MECHANISM

Max R. C. Bruhn, Jr., Spring Lake, Mich., assignor to Grand Haven Stamped Products Company, Grand Hills, Mich.

Filed May 25, 1972, Ser. No. 256,755

Int. Cl. G05g 9/12

U.S. Cl. 74—476 **12 Claims**



A lift gate mechanism for preventing accidental engagement of the reverse gear in a gear-shifting apparatus in which the shifting stick when moved vertically allows shifting of the reverse gear. The shifting stick is pivotal about an axis which is guided along on arcuate cam means for providing the proper amount of restraint against moving the stick vertically into reverse gear actuating position, but facilitating ease in shifting into reverse gear when desired.

3,786,691

VEHICLE STEERING GEAR

Bengt Lindstrom, Eriksbergsgatan 34, Stockholm, Sweden

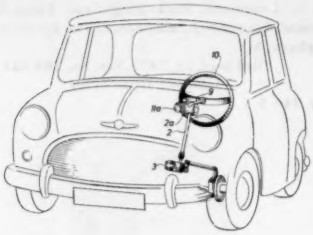
Filed Aug. 18, 1972, Ser. No. 281,800

Claims priority, application Sweden, Aug. 23, 1971, 10689/71

Int. Cl. B62d 1/18; F16h 1/14

U.S. Cl. 74—493 **4 Claims**

A vehicle steering column is divided into an upper and a lower column section connected through a bevel gear unit. The two sections are off-set and may be adjusted to different angular positions. An impact axial force of a predetermined magnitude on any of the column sections will release the connection between the column sections in order to prevent that excessive impact forces are transmitted to the driver.



3,786,692

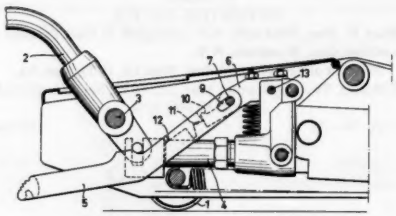
HYDRAULIC GARAGE JACK

Bengt Anders Bjork, Eskilstuna, Sweden, assignor to Domkraft AB Nike, Eskilstuna, Sweden

Filed Apr. 6, 1972, Ser. No. 241,548

Int. Cl. G05g 1/14

U.S. Cl. 74—512 **5 Claims**



A garage jack, the load is lowered by depressing a pedal at the end of a pedal arm. To prevent the load from being lowered by unintentional depression of the pedal, the pedal arm is divided into an outer portion connected with the pedal proper, and an inner portion. The portions are adapted to be disengaged from each other such that in disengaged position the pedal cannot effect lowering of the load.

3,786,693

DETENT MECHANISM FOR RELEASABLY SECURING RELATIVELY ROTATABLE MEMBERS

Hans K. Keipert, Glenview, Ill., assignor to Teletype Corporation, Skokie, Ill.

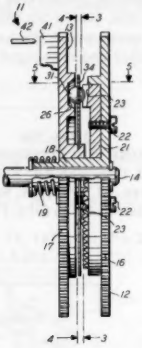
Filed May 25, 1972, Ser. No. 256,867

Int. Cl. G05g 5/06

U.S. Cl. 74—527 **6 Claims**

First and second disks are mounted on a common shaft for rotation relative to each other, the second disk being releasably urged into contact with the first disk by a spring. A plurality of ball detents disposed about the face of the second disk seat in a plurality of radially extending grooves formed in the face of the first disk. This permits the disks to be releasably secured in a fixed angular relationship by the force of the spring. Any desired one of a plurality of angular relationships between the disks may be selected by rotating the disks relative to each other through a desired angle. The selected angular relationship is then maintained by the urging force of the spring which seats the plurality of ball detents in adjacent ones of the plurality of grooves. Each of the plurality of ball detents

is freely movable longitudinally over an adjustment range to automatically seat each ball detent in a corresponding one of



the plurality of grooves. In one example, the adjustable disks are gears, driven alternately, to provide a paper feeding drive of variable stroke for a teleprinter.

3,786,694

DAMPING DEVICE FOR AN INHOMOGENEOUS CENTRIFUGE ROTOR

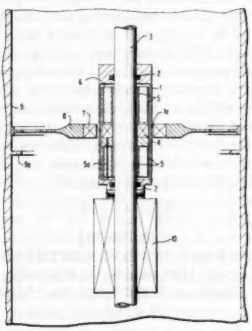
Eberhardt Willeitner, Munich, Germany, assignor to Maschinenfabrik Augsburg Nuernberg Aktiengesellschaft, Munich, Germany

Filed May 8, 1972, Ser. No. 250,913

Claims priority, application Germany, May 7, 1971, 2122 602

Int. Cl. F16f *15/22*

U.S. Cl. 74—573 **14 Claims**



A damping device for damping the deflections of an inhomogeneous centrifuge rotor which is elastically supported on both sides, in which the damping device is arranged along the rotor axis on the inside of the rotor and the deflections of the rotor are transmitted to the damping device with the use of a system of coaxial ring magnets by way of a disc and devoid of mechanical contact.

3,786,695

REDUNDANT PITCH LINK

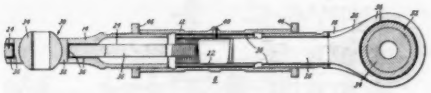
Lawrence D. Barrett, Jr., Glen Mills, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 28, 1972, Ser. No. 248,370

Int. Cl. F16l

U.S. Cl. 74—586 **17 Claims**

A redundant pitch link for providing a connection between a helicopter rotor blade and control assembly. A primary load path is provided for use during normal operation and a secondary load path is provided in the event the primary load path becomes inoperable. The pitch link is constructed by locating a primary turn buckle around a secondary or back-up turn



buckle. Teflon fabric is used to prevent fretting while maintaining the secondary turn buckle in a substantially unloaded condition during normal usage as well as when the secondary turn buckle is operative due to failure of the primary turn buckle.

3,786,696

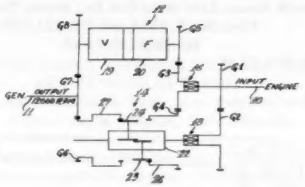
STARTER-DRIVE

Mohammed A. Aleem, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sept. 11, 1972, Ser. No. 288,153

Int. Cl. F16h *47/04*; F02c *7/26*

U.S. Cl. 74—687 **9 Claims**



A starter-drive for use between an aircraft engine and a generator to transmit power in either direction between the engine and the generator, for driving the engine from the generator in a starting mode, and for driving the generator from the engine in a generating mode, including, a generator shaft, an engine shaft, a differential for transmitting power from the engine shaft to the generator shaft, a hydrostatic transmission including one hydraulic unit connected for rotation with the generator shaft, and a second hydraulic unit connected for rotation with a control gear in the differential, a first one-way clutch connecting the second hydraulic unit to drive the engine shaft exclusively through the hydrostatic transmission during starting, a second one-way clutch connecting the engine shaft to the differential to transmit power from the engine to the generator after the engine is started, and means for varying the displacement of one of the hydraulic units to bring the engine shaft up to speed during the starting mode and to add or subtract speed in the differential during the generating mode.

3,786,697

METHOD AND APPARATUS FOR PREPARING THE ENDS OF CABLES FOR SPLICING

Eugene V. Abarotin, Franklin Twp., Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

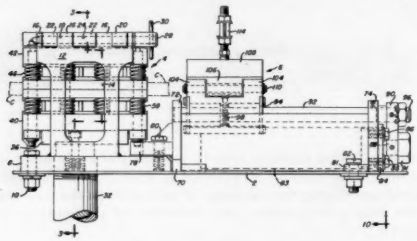
Filed Apr. 12, 1972, Ser. No. 243,331

Int. Cl. H02g *1/12*

U.S. Cl. 81—9.51 **5 Claims**

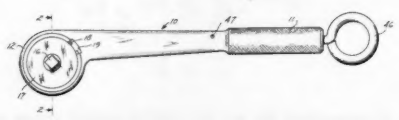
To prepare a multi-conductor jacketed cable for splicing it is necessary to remove the jacket for some distance from the end of the cable and to cut the conductors so that they extend for different distances from the end of the jacket. This is done by first gripping the cable by a clamp some distance from its end. Longitudinally spaced pairs of cutters are then brought

together to cut through the conductors and through the jacket to the conductors with the cut through the conductors being spaced toward the clamp from the end of the cable a greater distance than the cut through the conductors. The clamp is



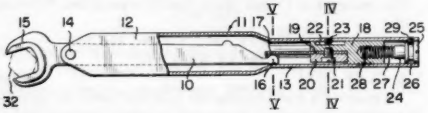
then moved away from the cutters so as to pull the main portion of the cable with it while leaving the portions of the jacket and conductors between the cutters and the end of the cable behind.

3,786,698
DOUBLE RATCHET WRENCH
Henry T. Diehl, 1722 Certainty Dr., Point Pleasant, N.J., and James D. Rouse, 2100 Brier Oak Dr., Bryon, Tex.
Filed Jan. 8, 1973, Ser. No. 321,778
Int. Cl. B25b *13/46*
U.S. Cl. 81—57.39 **6 Claims**



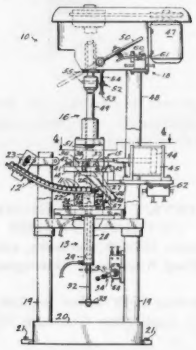
A double ratchet wrench capable of loosening or tightening nuts either in a conventional reciprocating arcuate manner when the nuts are freely accessible thereto, or in a linear reciprocating manner when the nuts are in a cramped or inaccessible area and usage of the wrench is not possible in the conventional manner. The wrench includes a head and a body, the head being provided with a spindle having ends for receiving nut sockets, and first and second pawls for mesh with respective ratchets. Located on the spindle is a double spool, each spool having spring members thereon which are cooperatively associated with a rod which extends through the handle. Upon linear reciprocating movement of the rod, the spools are moved to rotate the spindle to either loosen or tighten the nuts.

3,786,699
PREDETERMINED TORQUE RELEASE WRENCH
Seiichiro Kobayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Nakamura Seisakusho, Tokyo, Japan
Filed Dec. 11, 1972, Ser. No. 313,757
Int. Cl. B25b
U.S. Cl. 81—52.4 **4 Claims**



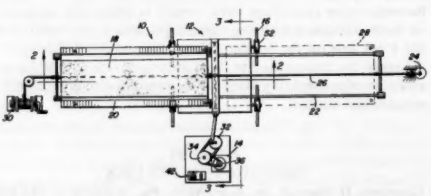
A predetermined torque release wrench comprises a tubular handle member, a torque transmitting arm pivotally connected to the front end of the handle member and a leaf spring having an arcuate shape in cross section. The leaf spring is so arranged that its concave surface is in faced relationship with the free end of the arm. One of the ends of leaf spring is fixed on a support block positioned in the rear portion of the handle member and the other end is engaged by the free end of the arm.

3,786,700
MACHINE FOR FINISHING PARTS
David P. King, 9835 Telegraph Rd., Erie, Mich.
Filed Jan. 13, 1972, Ser. No. 217,568
Int. Cl. B23b *5/16, 13/00*
U.S. Cl. 82—1 B **5 Claims**



A machine for finishing parts, such as welding tips, is disclosed. A driven spindle and cutting tool attached to the spindle are carried by a support over a work table which receives individual parts. The spindle and cutting tool are movable from an upper position to a lower, finishing position against a part. A feeding mechanism below the work table transfers the parts sequentially to a chucking mechanism which retains a part in a fixed finishing position beneath the cutting tool. A chute transfers finished parts away from the machine. A fluid control system is provided for automatic, sequential operation of the feeding and chucking mechanisms.

3,786,701
DEVICE FOR CUTTING URETHANE FOAM
Eugene A. Ludwig, 1106 Greene St., Magnolia, Ark.
Filed Nov. 5, 1971, Ser. No. 196,111
Int. Cl. B26d *3/10, 3/28*
U.S. Cl. 83—1 **8 Claims**



A cutting device for urethane foam and the like, said device comprising a carriage adapted to advance a bun or slab or urethane material through a cutter assembly including groups of elongated cutting wires which are heated and oscillated lon-

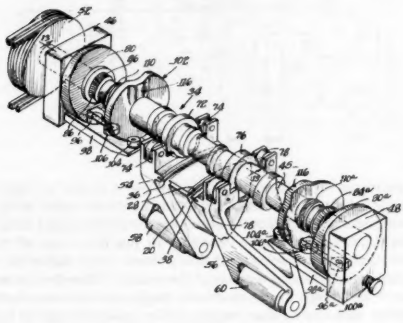
gitudinally to clean the wires as the material is advanced, one group of cutting wires being adapted to follow a vertical relief pattern, thereby cutting a corresponding pattern in the material.

3,786,702

METHOD AND TOOLING FOR CUTTING SIDE SEAL GROOVES

Oliver E. Saari, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 14, 1972, Ser. No. 244,030
Int. Cl. B26d *3/06*; B23d *5/04*
U.S. Cl. 83—5 **12 Claims**



The present invention relates generally to improvements in methods of and apparatus for forming longitudinal slots in the side surface of a rotor. More specifically, the present invention is directed to novel and practical methods and apparatus whereby longitudinal seal accommodating slots may be formed in the side wall of the rotor of a rotary internal combustion engine. An embodiment of the invention disclosed herein contemplates the use of reciprocable blade members having aligned slot cutting teeth along one marginal edge, the opposite margin of the blades being gripped within a reciprocable or oscillating blade holding device. Means is provided for securing the rotor in a fixed predetermined position with the side surfaces thereof being located in proximity to and in substantial parallelism with the aligned slot cutting teeth of a pair of spaced blades. Relatively short reciprocable synchronous strokes of the blades cause slots of predetermined depth to be formed simultaneously in each side surface of the rotor. The blades disclosed herein are arcuate in shape so as to produce corresponding arcuate slots in the side surfaces of the rotor.

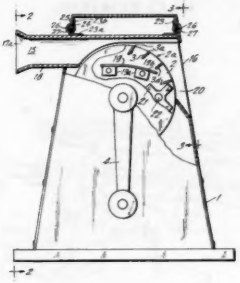
3,786,703

FRANKFURTER CUTTING AND SCORING APPARATUS

David Piel, New York, N.Y., assignor to Round Dog Corporation of America, New York, N.Y.

Filed Oct. 10, 1972, Ser. No. 296,060
Int. Cl. B26d *3/08*
U.S. Cl. 83—10 **15 Claims**

A device for the continuous and rapid cutting and scoring of frankfurters is described and comprises a rotatable annular shaped planar cutting means, a plurality of transverse cutting means mounted at spaced intervals along the periphery of said annular cutting means, and means associated with said cutting



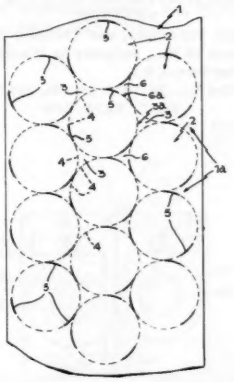
means for guiding a frankfurter into a position such that the frankfurter is cut and scored but not severed by said cutting means.

3,786,704

METHOD FOR MANUFACTURING METALLIC OBJECTS FROM CIRCULAR PLATES

Maurice Lachaussee, Rue de l'Yser, Ans, Belgium, and Andre Maigret, Avenue de la Grange, Saint-Maur-des Fosses, France

Filed Mar. 20, 1972, Ser. No. 235,983
Claims priority, application Belgium, Mar. 19, 1971, 43234
Int. Cl. B26f *1/38*
U.S. Cl. 83—39 **8 Claims**



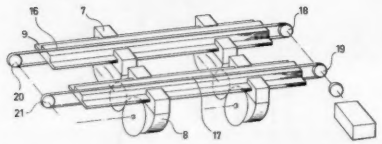
In a method for manufacturing metallic objects from circular plates which are in staggered arrangement and are perforated on a part of their outline exactly at the diameter of the serviceable part in order to be held in the metallic strip in which they are formed which passes step by step beneath the moulding tools there is provided the step which consists in arranging said plates in the strip in order to be immediately tangential in respect to each other and separated solely by equilateral triangles having concave sides which surround said plates.

3,786,705

APPARATUS FOR SLITTING MOVING WEBS

Gerhard Walter Dorfel, Weilheim-Teck, Germany, assignor to A. Osakeyhtio Ahlstrom, Noormarkuu, Finland

Filed Aug. 31, 1971, Ser. No. 176,542
Claims priority, application Finland, Aug. 31, 1970, 2405
Int. Cl. B23d 19/06
U.S. Cl. 83—71 4 Claims



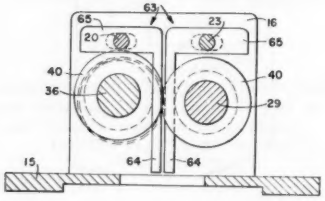
Each one of the blades forming a web slitting blade pair and positioned at opposite sides of the web adjacent each other is provided with separate moving means. The separate moving means for a blade pair are connected to each other outside the web so that the blades may be moved together the web being between them and regardless whether the blades are in contact with each other in a cutting position or separated from each other in an inactive position. The blade moving means for the blades of a pair may comprise two threaded spindles extending along rail or the like on which blade supporting carriages are movable driven by said spindles. Further may a registering device be connected to the blade moving means to register the positions of all the blades and to transmit the information to a computer controlling the slitting operation.

3,786,706

PRECISION SLITTING MACHINE FOR PLASTIC SHEETING

Frederick Hyatt, Providence, and Theodore Robert Coburn, Coventry, both of R.I., assignors to Marshall & Williams Company, Providence, R.I.

Filed Nov. 24, 1971, Ser. No. 201,913
Int. Cl. B23d 19/06
U.S. Cl. 83—122 1 Claim



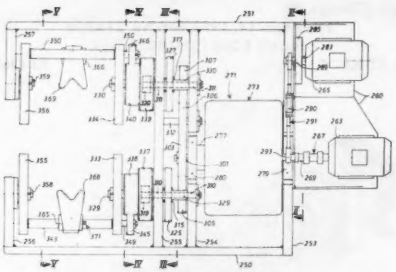
A slitting machine for cutting thin plastic sheeting into narrow ribbons. A plurality of rotary cutter blades and a plurality of spacers are alternately fastened on a pair of spaced shafts with the blades on one shaft overlapping the blades on the other shaft. Opposed guide fingers suspended in pairs from a mounting means with each pair of guide fingers aligned with the spacers on both shafts are provided in order to define a guide path for the plastic sheeting.

3,786,707

APPARATUS FOR CUTTING OFF SUCCESSIVE PORTIONS FROM A STRAND OF PLASTIC MATERIAL SUCH AS A STRAND OF VISCOUS GLASS

Kurt Becker, Obernkirchen, and Hans-Georg Seidel, Rinteln, both of Germany, assignors to Hermann Heye, Allee, Obernkirchen, Germany

Filed May 19, 1972, Ser. No. 255,033
Claims priority, application Germany, May 29, 1971, 2126825
Int. Cl. B26d 1/40
U.S. Cl. 83—299 10 Claims



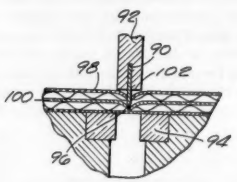
Apparatus for cutting off portions from a strand of plastic material advancing in axial direction in which a pair of opposite substantially parallel cutting knives are arranged to opposite sides of the strand movable in the direction of the strand axis and toward and away from each other in a direction transverse to the axis of the strand to thereby cut the latter. The knives are respectively supported on two shafts which in turn are turnably supported at opposite ends in two pairs of carrier discs and means are provided to rotate the two pairs of carrier discs about their axes while preventing rotation of said shafts about the axes of the latter so as to maintain the knives parallel to each other during their movement.

3,786,708

PUNCH FOR CORRUGATED BOARD

Richard G. Mumper, Milwaukee, Wis., assignor to Milwaukee Tool & Machine Co., Inc., Milwaukee, Wis.

Filed Feb. 27, 1973, Ser. No. 336,314
Int. Cl. B26f 1/14
U.S. Cl. 83—332 7 Claims



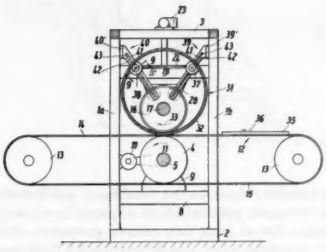
Apparatus for slotting corrugated board for box partitions includes a reciprocating punch which is received in the female slotting die and in which a thin liner knife located intermediate the side walls of the male punch and extending from the end wall of the male punch initially contacts and severs the board liners to prevent stretching and tearing of the board by the male punch as the punch engages the board and moves into the female die.

3,786,709

ROTARY STAMPING APPARATUS

Ernst Maximilian Spengler, Lerchenstrasse 47, Heusenstamm near Offenbach am Main, Germany

Continuation-in-part of Ser. No. 32,325, April 27, 1970, abandoned. This application May 1, 1972, Ser. No. 248,878
Claims priority, application Germany, May 7, 1969, P 69 18 516.6
Int. Cl. B26d 1/28
U.S. Cl. 83—339 20 Claims



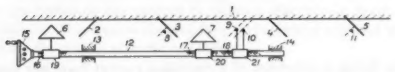
This rotary stamping apparatus includes a presser roller supported inside a hollow cylinder roller which carries tool means on its outer surface. The presser roller presses the hollow cylinder toward a counter roller whereby the hollow cylinder is positively held and a working area is formed through which sheet material is fed from which shapes are punched by said tool means when the rollers are rotated. The hollow cylinder roller is also held in position by automatically adjustable guide rollers.

3,786,710

MEANS FOR CUTTING PLATES FOR TRANSFORMER CORES

Olle Backlin, Ludvika, Sweden, assignor to Allmann Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed June 1, 1972, Ser. No. 258,590
Int. Cl. B26d 1/00
U.S. Cl. 83—406 5 Claims



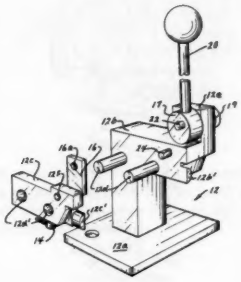
For cutting in sequence from a strip of sheet metal all the plates of a transformer core which are interleaved with separate yoke and leg plates, a number of shears are placed obliquely in relation to the feeding direction of the metal strip to cut off plates from the metal strip, along with a number of punches to make notches in the yoke plates for connection of the central leg to the yoke. A number of stops movable into and out of the path of the strip are provided to stop the strip in proper position before each cutting step.

3,786,711

RING SIZE CUTTER

Melvin A. Lamey, 223 N. Main St., Oakland City, Ind.

Filed May 12, 1971, Ser. No. 142,442
Int. Cl. B26d 5/16
U.S. Cl. 83—628 4 Claims



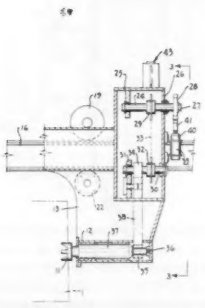
A ring size cutter whereby a ring is positively and accurately cut through cam controlled blade action, and where cutting blades of different thicknesses are readily substituted.

3,786,712

SAWMILL LOG INDEXING DEVICE

Wilson Joseph Mackin, Vancouver, B.C., Canada, assignor to Greenleaf Holdings Limited, Vancouver, British Columbia, Canada

Continuation of Ser. No. 6,349, Jan. 28, 1970, abandoned. This application June 28, 1972, Ser. No. 267,209
Claims priority, application Canada, Jan. 29, 1969, 41441
Int. Cl. B27b 7/04, 29/08
U.S. Cl. 83—708 7 Claims



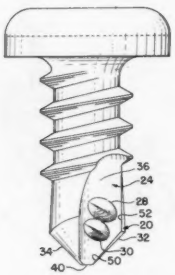
An indexing mechanism for use in a log sawmill which is mounted on the log carriage remote from the log mounting chucks. The indexing device enables the operator to position the log accurately for cutting and to rotate the log for subsequent cuts. The device is remote from the mounting chucks so that it can be protected from mechanical damage and so that it can be dimensioned to provide extremely accurate indexing.

3,786,713

CHIP BREAKER DRILL SCREW

Henry A. Sygnator, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 15, 1971, Ser. No. 189,572
Int. Cl. F16b *25/00*
U.S. Cl. 85—41 3 Claims



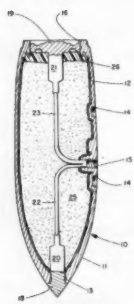
A drilling and thread cutting screw having a drill point including generally concave surfaces forming flutes therein with discrete obstructions formed on the concave surfaces to effectively break chips produced by cutting edges in the drill point.

3,786,714

MILITARY BOMB AND METHOD OF MAKING SAME

John E. Dereich, Edgeworth; James E. Gleeson, and Glenn J. Earle, both of Pittsburgh, all of Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Division of Ser. No. 86,089, Nov. 2, 1970, Pat. No. 3,693,548.
This application Apr. 13, 1972, Ser. No. 243,744
Int. Cl. F42b *33/02*
U.S. Cl. 86—23 2 Claims



A military bomb is provided which has an elastomeric tail pad and seal formed from a composition including the reaction product of a mixture of asphaltic filler; hydroxy terminated polydiene; non-volatile organic polyisocyanate.

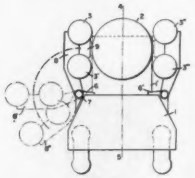
The military bombs can be assembled and filled with explosive compositions in a vertical, nose down position and can be sealed with the present elastomeric tail pad while in that vertical position. In a short period the completed military bombs can be stacked horizontally or in any other disposition regardless of whether the explosive composition has congealed or not.

3,786,715

RAPID LOADING SYSTEM FOR MISSILES

Georges Even, 7 Ave. Pierre Grenier, Boulogne-sur-Seine, France

Filed June 1, 1971, Ser. No. 148,389
Claims priority, application France, Aug. 25, 1970, 70.31066
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.805 5 Claims



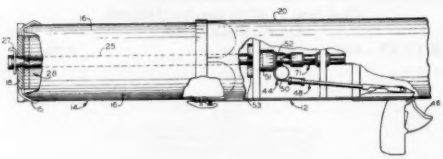
This invention relates to the feeding of missiles to missile launchers and more particularly to a system comprising a support member for at least one missile container, translation means for fetching each missile carried by said supporting member from a waiting position to a loading position in contact with the launcher by a rotational movement in a plane perpendicular to the missile axis, first temporary latching means of the supporting member with the translation means during the common movements thereof, second temporary latching means of the launcher with the supporting member in the loading position, and means for establishing electrical connections between the launcher and each container and/or missile in the loaded position thereof.

3,786,716

SAFETY INDEXING DEVICE FOR LAUNCHER FIRING MECHANISMS

Dennis L. Wilson, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 158,792, July 1, 1971, abandoned. This application Dec. 12, 1972, Ser. No. 314,491
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.812 6 Claims



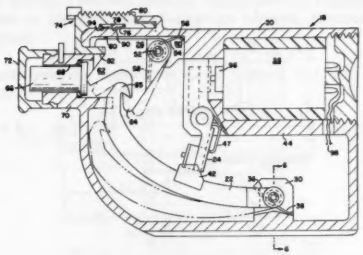
The firing mechanism of a multishot rocket launcher comprises a shaft journaled for rotation within the launcher case and for longitudinal displacement between an extended and a telescoped position respective thereto. A firing pin mechanism carried by the shaft for longitudinal displacement therewith successively retracts and releases a plurality of firing pins responsive to rotation of a rotary cam on the shaft by a trigger mechanism. Displacement of the shaft to the telescoped position disconnects the trigger mechanism therefrom and engages the shaft with a safety guide tube thereby indexing the firing pin mechanism so as to be safely uncocked and securing it against actuation after being indexed.

3,786,717

ELECTRICAL FIRING MECHANISM

Wiley B. Vickers, Huntsville, and Lonnie L. Looger, Madison, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 29, 1972, Ser. No. 284,533
Int. Cl. F41f 3/04
U.S. Cl. 89—1.814 4 Claims



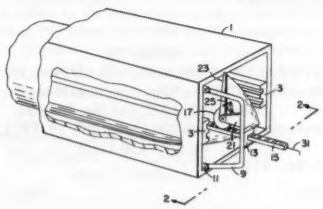
Electrical firing mechanism for a light weight, portable, rocket launcher. The mechanism includes means for actuating a battery for supplying an electrical pulse to the rocket carried in the launcher for ignition of the rocket motor.

3,786,718

MISSILE EXTRACTION DEVICE

Frank G. Appleby, Cypress; Edmund J. Rodwan, Venice, and William Lee, Costa Mesa, all of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 118,015, Feb. 23, 1971, abandoned. This application Jan. 22, 1973, Ser. No. 325,498
Int. Cl. F41f 9/00
U.S. Cl. 89—1.805 1 Claim



A device for moving a missle having shoes in a container or canister having launch rails for engaging the shoes. The device includes a bracket for attachment to one end of the container, a bar disposed for movable cooperation with the rails and a ratchet for cooperation between the bracket and bar for movement thereof along the rails. A claw member is pivoted on the bar and disposed for engagement with one of the shoes for operation of the ratchet to remove the missile from the container. The claw is disposed for engagement with the shoe to slide the missile into the container.

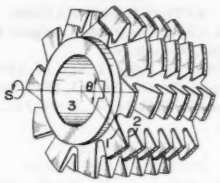
3,786,719

HOBBING CUTTER

Kanbei Kimura, 1-48-5, Nogata, Nakano-ku, Tokyo, and Masato Ainoura, 1253, Eguchi, Kitashigeyasa-machi, Miyaki, both of Japan

Continuation of Ser. No. 39,085, May 20, 1970. This application May 4, 1972, Ser. No. 250,402
Int. Cl. B23f 19/06; B26d 1/12
U.S. Cl. 90—1.6 1 Claim

The method of finishing the sides of the teeth of a roughly formed and hardened gear blank, of which the bottom portions of the grooves between adjacent teeth have been cleared away, by means of a hobbing cutter wherein the top edges of the cutter blades run free of the bottoms of the grooves and the leading surfaces of the blades including both side edges



thereof which serve to perform the finish-cutting of the confronting sides of adjacent teeth are inclined in a backward direction at an angle of between 15° and 60° relative to the direction of rotation of the cutter.

3,786,720

REMOVAL OF SURFACE METAL BY SHAVING

George Zavodny, Jr., Palos Hills, Ill., assignor to La Salle Steel Company, Hammond, Ind.

Filed Sept. 1, 1972, Ser. No. 285,897
Int. Cl. B23b 3/00; B23d 1/00; B26d 1/00
U.S. Cl. 90—24 R 7 Claims

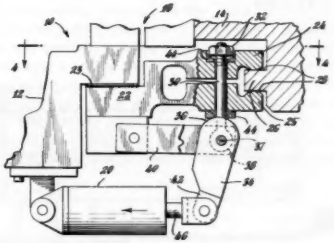
The removal of surface metal from bars, rods, tubes and the like by the use of a shaving tool which is preheated to elevated temperature to enhance tool life and surface finish of the work processed therethrough.

3,786,721

CLAMP FOR ROTARY TABLES

Kazimierz J. Reda, Trumbull, Conn., assignor to The Producto Machine Company, Bridgeport, Conn.

Filed Sept. 9, 1971, Ser. No. 179,005
Int. Cl. B23c 1/14
U.S. Cl. 90—58 B 3 Claims



A clamping apparatus for clamping a rotary table assembly, particularly when it is incorporated into a numerically controlled machine tool system where maintaining a static position without influencing table orientation is especially desirable. The clamping apparatus includes opposed clamping jaws which engage an annular clamping ring disposed on the rotary table. The clamping jaws apply essentially equal and opposite clamping forces to each side of the clamping ring to clamp the table without influencing the loading thereof in any direction. The gripping action of the clamping jaws is actuated by a levered linkage to attain a considerable mechanical advantage which thereby reduces the size and the expense of the apparatus and simplifies its incorporation into rotary table assemblies. Furthermore, the clamping apparatus is designed as an overcenter device so that when it is in its clamped position

a positive force is required to unclamp it. This provides fail safe operation inasmuch as failure of the clamp actuating device does not release the holding forces.

3,786,722

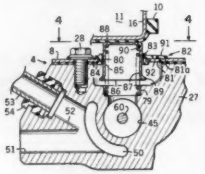
ANTI-SKID MECHANISM

John A. Machek, Creve Coeur, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Division of Ser. No. 199,431, Nov. 17, 1971, Pat. No. 3,752,536. This application Dec. 13, 1972, Ser. No. 314,820

Int. Cl. F15b *11/08, 13/04, 15/22*

U.S. Cl. 91—26 **3 Claims**



An anti-lock device for a vehicle brake system is provided with a control valve actuated in response to signals from a sensing mechanism to subject a control member to vacuum and selectively subject said control member to atmosphere for controlling the application of supplied fluid pressure to a vehicle brake, and throttling valve means is provided to control the subjection of said control member to the vacuum.

3,786,723

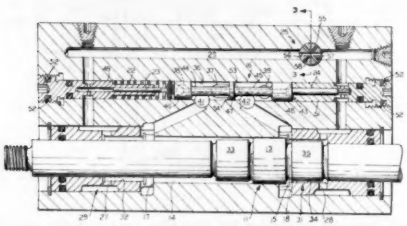
HYDRAULIC OSCILLATOR

Waldo G. Fruehauf, Kalamazoo, Mich., assignor to General Signal Corporation, Rochester, N.Y.

Filed May 15, 1972, Ser. No. 253,514

Int. Cl. F01*25/02, 31/00*

U.S. Cl. 91—284 **10 Claims**



The disclosure concerns a hydraulic oscillator of the type in which the distributing valve for the power element is shifted by pressures developed by pumping members operated by the power element. The device is relatively simple and is truly self-starting regardless of the position in which the power element is resting. Preferably, the distributing valve acts as a flow divider which diverts a portion of the supply flow to tank, and thereby precludes development of large pressure peaks at the ends of the strokes of the power element. Moreover, the flow-dividing action is adjustable so that oscillator frequency can be selected independently of the rate of supply.

3,786,724

DEVICE LIMITING THE DELIVERY OUTPUT OF A JACK

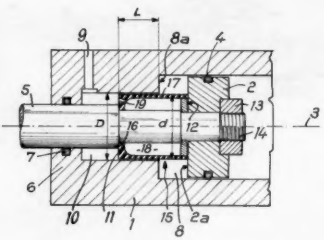
Louis E. Martin, Senlis, France, assignor to Societe Anonyme Poclain, Le Plessis-Belleville, Oise, France

Filed May 3, 1972, Ser. No. 249,879

Claims priority, application France, May 24, 1971, 7118647

Int. Cl. F15b *15/22*

U.S. Cl. 91—395 **5 Claims**



A device for limiting the delivery output of a jack having a complementary chamber of substantially smaller diameter opening into the end of a main delivery chamber, the complementary chamber having a delivery conduit, a deformable member coupled in translation with a piston rod and being capable of abutting the piston, the deformable member being capable of penetrating into the complementary chamber from the main delivery chamber and being of slightly smaller diameter and having complementary walls with respect to the walls of the complementary chamber to form a passage between the end of main delivery chamber and the complementary chamber, the deformable member being deformed by fluid pressure to increase the transverse section of the passage between the walls of the deformable member and the complementary chamber.

3,786,725

HYDRAULIC TYPE MOLD CLAMPING DEVICE

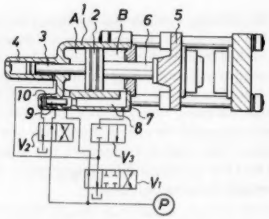
Katashi Aoki, 6037, Oaza Minamijo, Sakaki-machi, Japan

Filed July 5, 1972, Ser. No. 268,992

Claims priority, application Japan, July 10, 1971, 46/51277

Int. Cl. F15b *11/18*

U.S. Cl. 91—411 A **5 Claims**



A mold clamping device of hydraulic type having a mold clamping cylinder including a mold clamping piston coupled through a ram portion thereof to a movable plate for supporting a movable mold, and a high-speed mold shifting cylinder including a mold shifting piston associated with said mold clamping piston through a rod portion thereof, according to the invention, said device further comprising a passage interconnecting two chambers formed at both sides of said mold clamping piston in said mold clamping cylinder, and a valve

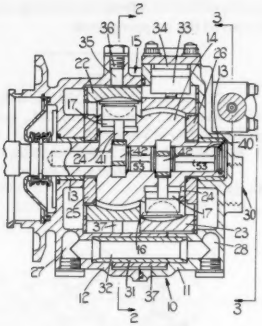
located in said passage for opening and closing the passage in accordance with the operation of the mold clamping device, while said two chambers are connected to hydraulic lines through portions of said passage at corresponding sides of said valve.

3,786,726

ROTARY HYDRAULIC MACHINES

Frank George Freeman, Solihull, Warwickshire, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Oct. 19, 1971, Ser. No. 190,632
Claims priority, application Great Britain, Oct. 21, 1970, 49,988/70
Int. Cl. F01b *13/06*
U.S. Cl. 91—492 **10 Claims**



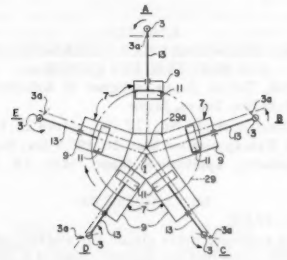
A radial piston pump has two rows of radial bores and two associated movable cam rings. The cam rings are constrained to move in unison by arms which are secured to a hollow shaft extending parallel to the axis of the pump rotor. Within the shaft is a passage by means of which the high pressure ports associated with respective rows of bores are interconnected.

3,786,727

EXPANSIBLE CHAMBER DEVICE

Andrew A. Baumann, 3810 Bowen St., St. Louis, Mo.

Filed Sept. 23, 1971, Ser. No. 183,134
Int. Cl. F01b *13/01*
U.S. Cl. 91—493 **18 Claims**



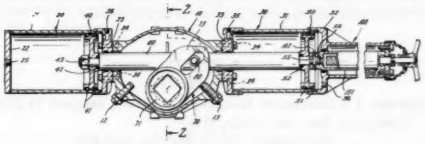
An expansible chamber device, adapted for operation either as a motor or a pump, having an inner pin and a plurality of outer crank pins rotatable about axes parallel to the axis of the inner pin and spaced at intervals around a circle surrounding the inner pin, with means interconnecting the outer pins and the inner pin and interconnecting the outer pins with one another, a cluster of double-acting cylinder and piston means, one for each outer crank pin, each having its cylinder connected to the inner pin and its piston rod connected to a respective outer crank pin, and means for controlling the supply and exhaust of fluid to and from opposite ends of each cylinder.

3,786,728

ACTUATOR OVERRIDE

John M. Sheesley, and Ronald A. Gulick, both of Houston, Tex., assignors to Research Engineering Company, Houston, Tex.

Continuation of Ser. No. 865,342, Oct. 10, 1969, abandoned.
This application Aug. 27, 1971, Ser. No. 175,749
Int. Cl. F01b *9/02*; **F15b** *13/10*
U.S. Cl. 92—33 **6 Claims**



An actuating device may comprise: at least one cylinder; means for providing fluid under pressure to the cylinder; a piston mounted in the cylinder for longitudinal sliding motion; a rod attached to the piston for longitudinal motion therewith; a crank member adapted for attachment to apparatus to be actuated; a mechanism connecting the rod and crank member adapted to convert longitudinal motion of the rod to rotary motion of the crank member; and a manual override assembly connected to the rod for displacement of the rod without providing fluid under pressure to the cylinder. The manual override assembly may comprise a ball screw mechanism in which the nut portion may be non-rotatingly attached by a hollow shaft to the end of the rod. The screw shaft of the ball screw mechanism may be mounted coaxially with the rod and rotatingly supported on a support housing adjacent to the cylinder. The end of the screw shaft may be adapted to receive a disengageable handwheel for rotation of the screw shaft and consequent reciprocation of the nut portion and attached rod.

3,786,729

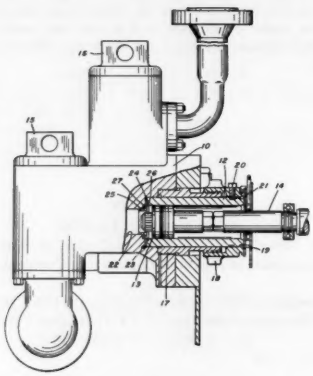
LINER SEAL FOR RECIPROCATING PUMPS

Michael L. Rizzone, Dallas, Tex., assignor to United States Steel Corporation

Filed June 22, 1972, Ser. No. 265,378
Int. Cl. F01b *11/02*; **F16j** *15/00*
U.S. Cl. 92—171 **5 Claims**

A liner seal for use in reciprocating pumps. The seal includes an insert of erosion- and corrosion-resistant material (for example stainless steel or titanium) placed between the liner and fluid-end piece. A gasket is interposed between the end face of the liner and the insert, and preferably another gasket of smaller diameter between the insert and the fluid-

end piece. The insert enables fluid-tight seals to be maintained between the liner and the fluid-end piece through liner

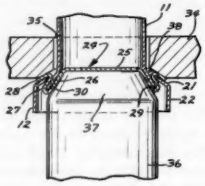


changes involving various liner bore sizes. In the event the insert itself is damaged, it is replaced readily, whereby it affords a renewable seal face for contact with the liner.

3,786,730
TIRE PUMP

Gordon J. Linderholm, Minneapolis, Minn., assignor to Pyroil Company, Inc., La Crosse, Wis.

Filed June 7, 1972, Ser. No. 260,428
Int. Cl. F16j *1/02*
U.S. Cl. 92—169 **2 Claims**



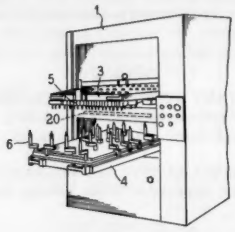
A tire pump with an upright cylinder mounted on a base wherein the connection between the cylinder and base is made by a circular connector element having annular interlocking engagement with both the cylinder and base eliminating the use of solder, rivets or the like. The actual connection is effected by arranging the cylinder, connector and base in a stacked assembly and then placing the assembly between two closing dies which deform the connector into a tight interlocked connection with the other components.

3,786,731
PRESS FOR CUTTING SHEET MATERIAL

Jacques Bobst, Epalinges; Walter Gruetter, Morrens, and Edwin Bollinger, Morges, all of Switzerland, assignors to J. Bobst & Fils, S.A., Prilly, Switzerland

Filed July 10, 1972, Ser. No. 269,952
Claims priority, application Switzerland, July 13, 1971, 10303/71
Int. Cl. B31b *1/74*
U.S. Cl. 93—36 A **4 Claims**

A press for cutting sheet material includes a waste stripping section and is provided with waste ejecting elements supported by two frames which, in turn, are slideably receivable within two relatively moveable carriages whereby the frames

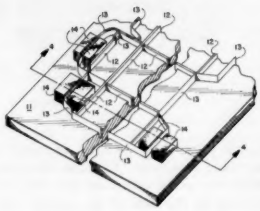


can be slideably withdrawn from the carriages in order to permit adjustments of the stripping tools.

3,786,732
CUTTING AND SCORING DIE

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 16, 1972, Ser. No. 226,727
Int. Cl. B26f *1/44*
U.S. Cl. 93—58.3 **7 Claims**



An apparatus for cutting and scoring sheet-like material is described comprising a single die plate which includes both severing elements and scoring elements mounted thereon. The severing elements constitute the usual knife blades employed in prior art sheet cutting and scoring dies. However, the scoring elements constitute novel pairs of knife blades which eliminate the need for a conventional makeready or female die as required in the prior art devices.

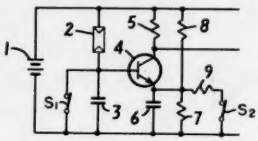
3,786,733
ILLUMINATION-TIME CHARACTERISTIC CIRCUIT FOR ELECTRIC EYE CAMERAS

Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

Continuation of Ser. No. 127,103, March 23, 1971, abandoned. This application Mar. 26, 1973, Ser. No. 345,118
Claims priority, application Japan, Mar. 25, 1970, 45-24481
Int. Cl. G03b *7/08*
U.S. Cl. 95—10 CT **1 Claim**

A built-in exposure timer circuit for electric eye cameras automatically correcting the exposure time of a photographic exposure by compensation for the nonlinearity of the illumination-resistance characteristic of the *Cds* in the circuit. The switching circuit of the timer circuit includes a first integrating circuit or network by which the quantity of light sensed by the Cds from the field or scene to be photographed develops a trigger output to a switching circuit whose output controls the closing of an electric shutter in a camera. The switching cir-

cuit has a trigger-level-determining network or circuit and a second integrating circuit or network and compares the voltage determined by the trigger-level-determining circuit with the voltage output of the light quantity integrating circuit and makes the trigger level itself a function of time.



3,786,734

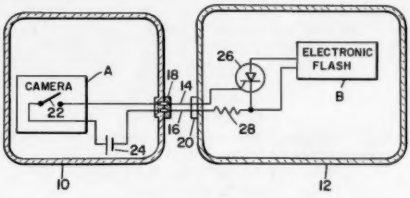
UNDERWATER ELECTRONIC FLASH ACTUATOR

Martin H. Long, Jr., 61 Camino Alto, and Alvin L. Pachynski, 423 Pixie Trl., both of Mill Valley, Calif.

Filed Oct. 27, 1972, Ser. No. 301,547

Int. Cl. G03b *15/05, 17/08*

U.S. Cl. 95—11 W **12 Claims**



An underwater electronic flash actuator for electronic flash apparatus contained in a waterproof housing separate from the camera and interconnected thereto by an electrical cable, in which the deleterious effects of salt water on the cable conductors are substantially eliminated. A battery is provided in the camera housing connected in series with the camera shutter switch. An electronic gating circuit, typically employing a silicon control rectifier, is provided in the electronic flash housing. The circuitry is interconnected by a pair of conductors between the camera and electronic flash housings so that the actuation of the shutter switch applies current from the battery to the gating circuitry to trigger the electronic flash.

3,786,735

PHOTOGRAPHIC APPARATUS

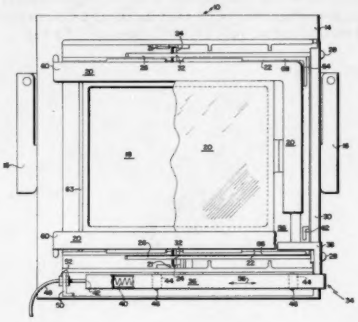
Myron A. Seiden, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 27, 1972, Ser. No. 292,487

Int. Cl. G03b *17/44*

U.S. Cl. 95—49 **5 Claims**

An automatic shutter control system for a photographic camera having a removable film holder and viewing screen. When the film holder is attached to the camera, the shutter control system closes down the shutter. Removal of the film holder for viewing and focusing actuates the shutter control system for automatically opening the shutter to a full aperture position in which the available focusing light is maximized. The need for manually opening the shutter to its fully opened position just prior to focusing is thereby alleviated.



3,786,736

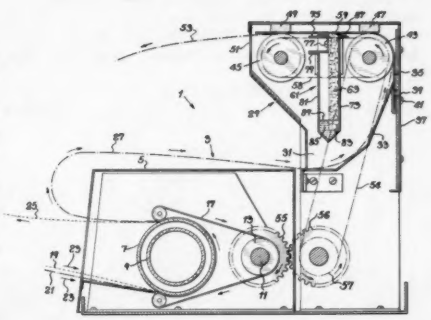
DIAZOTYPE DEVELOPING APPARATUS

Robert P. Neeb, Wake Forest; Henry W. Patrick, and Ray H. Mumford, both of Raleigh, all of N.C., assignors to Diazit Company, Inc., Youngsville, N.C.

Filed Nov. 2, 1971, Ser. No. 195,074

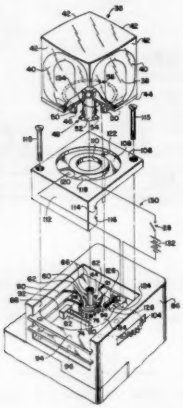
Int. Cl. G03d *5/06*

U.S. Cl. 95—89 R **2 Claims**



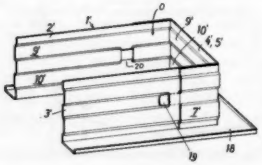
Apparatus and method for development of two-component diazotype sheets and webs. The developing solution is applied to the moving surface of the exposed diazo paper by the wiping action of a porous applicator pad that is kept damp and replenished by capillary, wicking action through the pad from a developer solution reservoir. The range of application extends from slightly less than 4 grams per square meter to just over 30 grams per square meter. A mechanism may be incorporated in the apparatus for oscillating the applicator surface transverse to the paper travel, such action serving to provide uniform developer application, and thereby eliminating streaking, particularly at low rates of developer application.

3,786,737
PHOTOGRAPHIC FLASH ASSEMBLY
David E. Van Allen, Malden, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Continuation of Ser. No. 41,681, May 25, 1970, which is a continuation of Ser. No. 743,744, July 10, 1968, abandoned.
This application July 17, 1972, Ser. No. 272,717
Int. Cl. G03b 19/00
U.S. Cl. 95—11 L 5 Claims



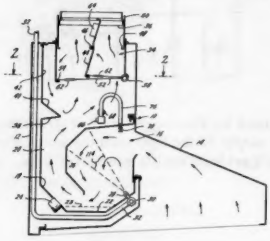
This disclosure relates to flash photography and particularly to apparatus for releasably mounting a multilamp photoflash unit on a photographic camera to facilitate sequential presentation of each lamp in the unit to a predetermined location for ignition in timed relationship to photographic exposure.

3,786,738
VENT OPENING GRILL
Tore Fahre, Oslo, Norway, assignor to Farex Fabriken A/S, Oslo, Norway
Filed June 20, 1972, Ser. No. 264,541
Claims priority, application Norway, June 22, 1971, 2357/71
Int. Cl. F24f 13/06
U.S. Cl. 98—114 10 Claims



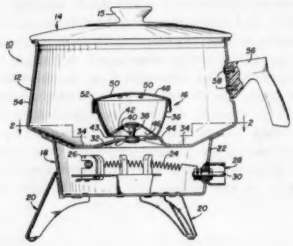
A vent opening grill having a rectangular frame composed of two pairs of parallel frame members surrounding a rectangular vent opening and consisting of metallic or plastic sheet material. The inner sides of the frame members are provided with elongated parallel grooves which snugly receive rails having rows of parallel pins for louvers which extend across the vent opening and are turnable about the respective pairs of pins. The louvers between one pair of frame members are normal and offset relative to the louvers between the other pair of frame members. The frame members of one pair are U-shaped and have pairs of legs which overlap and are connected with adjacent end portions of the other pair of frame members. One pair of frame members may be integral with a flat plate which surrounds one end of the vent opening.

3,786,739
VENTILATING SYSTEM
John David Wright, Houston, Tex., assignor to Industrial Industries, Inc., Houston, Tex.
Filed May 26, 1972, Ser. No. 257,423
Int. Cl. F23j 11/02
U.S. Cl. 98—115 K 7 Claims



A system for venting air laden with moisture, smoke, fumes, grease vapors and the like from environments such as kitchen areas. The system extracts nearly all grease vapors and a large proportion of other materials in the air and is adapted to periodically undergo a wash cycle to clean practically the entire system. The system includes a housing, a hood, a first chamber in the lower portion of the housing, a first series of nozzles for imparting an extraction spray to the first chamber, a second chamber in the upper portion of the housing communicating with the first chamber by means of a baffled conduit, a damper means for regulating exhaust, a suction fan and a second series of nozzles for imparting wash liquid to both chambers within the housing.

3,786,740
CORN POPPER
Wesley G. Martin, Manitowoc, Wis., assignor to Aluminum Specialty Company, Manitowoc, Wis.
Filed Oct. 10, 1972, Ser. No. 296,113
Int. Cl. A23l 1/18
U.S. Cl. 99—323.8 9 Claims

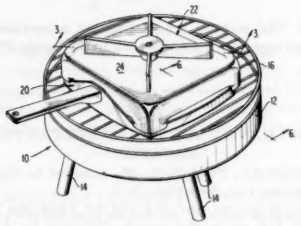


A corn popper includes a vessel having a low mass, heat conducting cup mounted in the bottom for holding butter to be melted while popping corn is being popped in the vessel.

3,786,741
SMOKING AND COOKING APPARATUS
Elizabeth Emmett Plumley, 44 Willway Ave., and David A. Brown, 46 Willway Ave., both of Richmond, Va.
Filed Aug. 4, 1972, Ser. No. 278,127
Int. Cl. A47j 37/07; A23b 1/04
U.S. Cl. 99—447 15 Claims

A smoking and cooking apparatus operable to overlay a cooking surface including a closed heat reflective member,

support members connected to and downwardly extending from the closed heat reflective member for supporting the member above a cooking surface. The closed heat reflective member in combination with the support members serve to reflect heat onto food cooking upon the cooking surface and to collect smoke above the cooking surface in order to flavor the food. Passages are fashioned laterally through the supporting members to permit circulation within the smoking and cooking apparatus while simultaneously providing a desirable retention of smoke adjacent to the food during the cooking and smoking thereof. The closed heat reflective member and support members may be operatively engageable with a griddle which comprises a generally square heat conductive plate. The plate is fashioned with upwardly extending flange means peripherally extending thereabout for engagement with the



support members. During a cooking operation the downwardly extending support members serve to maintain the closed heat reflective member generally above and in a parallel plane with respect to the heat conductive plate to facilitate the cooking and smoking of food upon the plate. After the cooking operation the closed heat reflective and support members may be disconnected from the griddle and inverted to serve as a grease collecting means, attarctive table server and the like. The closed heat reflective and support members in combination with the griddle may be advantageously utilized in combination with a barbecuing grill which is suitable to support a charcoal fire or the like. In this instance the griddle is provided with a plurality of apertures extending through the heat conductive plate to faciliate smoking the food during the cooking operation.

3,786,742

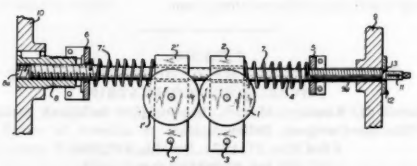
DEVICE FOR ADJUSTING THE SPRING FORCE ON FOLDING ROLLERS

Klaus Hertrich, Gohrenz, Germany, assignor to Veb Polygraph Leipzig, Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed Oct. 18, 1971, Ser. No. 189,848

Int. Cl. B30b *3/04*

U.S. Cl. 100—99 **2 Claims**



A device for adjusting the spring force pressing two axially parallel folding rollers, which comprises a shaft and two folding rollers having parallel axes and supported in swivel bearings. An abutment is spaced apart from each of the swivel bearings and mounted on the shaft. A compression spring is disposed between each of the folding rollers and an abutment. Two side walls are provided. The shaft has a thread at each of its ends. One of the ends of the shaft is threaded in a bore of one of the side walls. The other of the ends of the shaft is threaded in a threaded bore of the bushing. The bushing is disposed non-rotatably and axially displaceably in a bore of the other of the side walls, and the pitch of the threaded bore of the bushing is twice as great as the pitch of the threaded bore of said one of the side walls.

3,786,743

SPINDLE PRESS

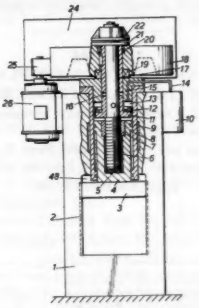
Helmut Dischler, Neusa-Udesheim, Germany, assignor to Noropress GmbH Iressen und Presswerkzeuge & Co. KG, Dusseldorf, Germany

Filed Sept. 26, 1972, Ser. No. 292,327

Claims priority, application Germany, Oct. 12, 1971, P 21 50 726.6

Int. Cl. B30b *1/08*

U.S. Cl. 100—270 **12 Claims**



The present invention is concerned with improvements to that type of spindle press which has a spindle mounted in the press frame in an axial thrust bearing, a fly-wheel continuously rotating in one direction and an hydraulically actuated coupling arranged between the fly-wheel and the spindle which coupling during the operational stroke produces a connection between the fly-wheel and the spindle.

To reduce or eliminate the risk of overloading in the late operation of the coupling at the end of the press stroke and thereby damage to the press or excessive wear on the coupling parts the spindle press in accordance with the invention is provided with a hydrostatic support device to absorb the axial forces this support device having a pressure chamber in pressure-fluid communication with a pressure chamber of an hydraulically actuating device for the coupling, the pressure chambers being connected to a common outflow valve which opens when a predetermined pressure is reached in the pressure-fluid system.

3,786,744

REFUSE COMPACTOR SUPPORT STRUCTURE

Frank E. Miller, and Charles E. Sulcek, both of Danville, Ky., assignors to Whirlpool Corporation, Benton Harbor, Mich.

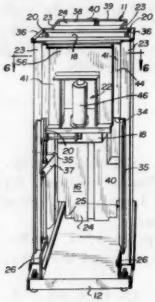
Filed Sept. 8, 1971, Ser. No. 178,604

Int. Cl. B30b *1/18*

U.S. Cl. 100—229 A **18 Claims**

A frame structure for use in a refuse compactor defining an enclosure of the compacting space. The frame further is formed to define means for guiding the compacting ram in the compacting operation. The frame may be used in conjunction with an outer, one-piece cabinet where the compactor com-

prises a freestanding compactor, or may itself define the enclosure of the compactor ram and receptacle without the need for an outer cabinet where the compactor is installed as an under-the-counter compactor. The frame may be formed of sheet metal to provide a simple, low cost support structure.



3,786,745

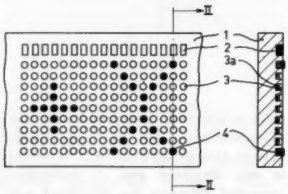
DURABLE REGISTRATION TEMPLATE FOR ELECTROSTATIC PRINTERS

Hans Dieter Hinz, Tornesch, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 177,255, Sept. 2, 1971. This application Dec. 15, 1972, Ser. No. 315,643

Int. Cl. G01d *15/18*

U.S. Cl. 101—1 **4 Claims**



A electrostatic template for use in a printing operation.

The template comprises a synthetic resin raster having discrete raster positions surrounded by metal to form the template. A synchronization track is provided on the template adjacent the raster positions and coincident with the movement of the template carrier.

3,786,746

HIGH SPEED ARTICLE CODING MACHINE

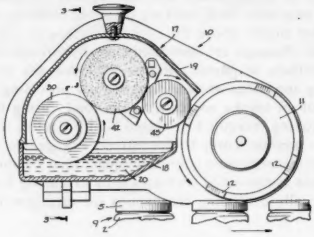
Cecil P. Roberts, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Oct. 6, 1971, Ser. No. 186,868

Int. Cl. B41f *17/16, 31/06*

U.S. Cl. 101—35 **3 Claims**

An improved coder is described for applying a legend or a code to an article such as a sealed package. As the articles move past the coder on a conveyor, the code symbols are applied to the moving articles by spaced coding heads on a rotating coding wheel. Improved means are provided to feed the required amount of ink from a reservoir to each of the coding heads. This means includes a thin rotating disc whose edge passes through the ink reservoir and which carries a bead of ink first to a transfer wheel. An improved ink transfer is obtained by spacing the disc from the transfer wheel so that the only direct contact is between a bead of ink on the disc and the transfer wheel. Adjustment of the disc rotational speed independently of the transfer wheel speed and the preset disc and transfer wheel spacing precisely control the amount of ink transferred. The transfer wheel engages a spreader wheel which in turn transfers the coding ink to the heads of the coding wheel.



3,786,747

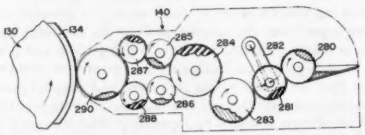
INKING MECHANISM FOR HIGH SPEED CAN PRINTING MACHINE

Wesley J. Szpitalak, Palos Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 501,372, Oct. 22, 1965, Pat. No. 3,683,799. This application Apr. 7, 1972, Ser. No. 242,110

Int. Cl. B41f *31/00*

U.S. Cl. 101—350 **2 Claims**



An automatic coating and printing machine wherein can bodies and like tubular members are atuomatically positioned on mandrels and thereafter serially presented to coating and printing blankets wherein the necessary coating and printing is effected thereon with the mandrels being rotated as the can bodies carried thereby contact the blankets of the coating and printing cylinders to transfer coating and printing materials to the can bodies. Thereafter, the appropriately coated and printed can bodies are automatically transferred from the mandrels to another conveyor. The mandrels are so mounted wherein when no can body is on a mandrel, the mandrel does not come into contact with the printing or coating blankets. The inking mechanism for the printing machine is designed to apply a uniform coating of ink to the printing drum by a drum inking roll which first has a heavy ink coat applied thereto followed by a second light smoothing ink coat over the heavy coat in advance of the printing drum.

3,786,748

STENCIL ASSEMBLY WITH FOLDABLE ADHESIVE COVERING GUARDIAN STRIP

Harold H. Rabelow, Marion, Ill., assignor to Marsh Stencil Machine Company, Belleville, Ill.

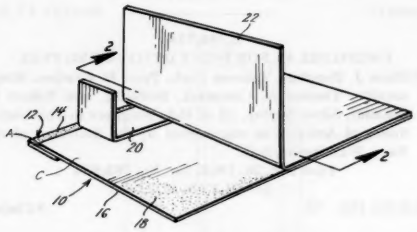
Filed May 27, 1971, Ser. No. 147,394

Int. Cl. B41n *1/24*

U.S. Cl. 101—128.1 **7 Claims**

There is disclosed a novel stencil assembly employed in duplicating address and other information on cartons, packages, and the like. The assembly includes a narrow strip with pressure sensitive adhesive on one side, a stencil tissue having a carbon material covering its back side, the stencil tis-

sue being connected along its upper front surface to the adhesive leaving a major portion of the adhesive exposed. A narrow guardian strip beneath the stencil tissue is connected to a portion of the exposed adhesive leaving a portion exposed. A



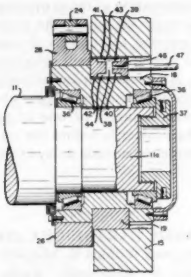
protective backing sheet is disposed beneath the guardian strip and stencil tissue with the upper edge of the backing sheet engaging the remaining exposed area of the adhesive. The guardian strip is foldable to cover the exposed adhesive strip, bared by subsequent removal of the backing sheet.

3,786,749

PRINTING PRESS CYLINDER SUPPORT AND CONTROL

Mahendra Vir Singh, Chicago, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1972, Ser. No. 242,034
Int. Cl. B41f *13/24, 13/26, 13/40*
U.S. Cl. 101—247 **2 Claims**



The present invention pertains generally to printing presses and more particularly to improved means for preloading the journal bearing housings for the cylinders of a printing press against the forces of impression. Rotatable eccentric bushings include hydraulically expandable pads for circumferentially restraining and radially stressing the bushings when activated by an elevated fluid pressure. Hydraulic and electric controls are included to provide proper sequential activation when the cylinder is tripped.

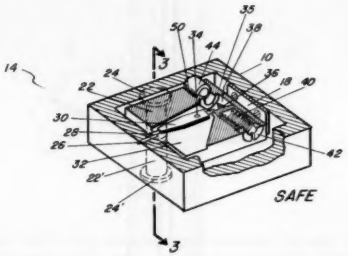
3,786,750

MOTION SENSITIVE EXPLOSIVE WITH A DELAY MECHANISM

Alexey T. Zacharin, Parsippany, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1973, Ser. No. 320,797
Int. Cl. F42b *23/26*
U.S. Cl. 102—8 **4 Claims**

A motion sensitive explosive device is kept in a safe unarmed condition by a pair of silicone gum plugs which have been expanded by absorption of a fluoro-carbon fluid such as FREON. The expanded plugs hold a trip lever arm immovable against a detent when the device is being deployed. The device when implaced is armed, after a time delay, by evaporation of the fluoro-carbon which causes shrinking of the plugs to their



normal size and release of the lever arm. Upon subsequent slight movement of the device the trip lever releases a spring loaded firing pin so that it can strike and ignite an impact detonator.

3,786,751

PRESSURE SENSITIVE MINE INSENSITIVE TO WATER DEACTIVATION

William O. Seals, Budd Lake Heights, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 226,545, Feb. 15, 1972. This application May 22, 1973, Ser. No. 362,721
Int. Cl. F42b *23/14*
U.S. Cl. 102—8 **7 Claims**

A pressure sensitive explosive composition is provided which is rendered insensitive to water or water vapor by means of a coating of an organo-functional silane capable of polymerization on contact with water or water vapor. Additionally, a method is provided of coating such a composition by the use of the above-mentioned silane in a halocarbon solvent having a relatively low vapor pressure at ambient conditions. The composition may be a mixture of an inorganic oxidizer and fuel such as potassium chlorate, red phosphorous and ground glass or a mixture of a primary explosive such as lead azide and a secondary explosive such as RDX, either mixture being coated with a silane such as $\gamma(\beta$ aminoethyl) aminopropyl trimethoxy silane applied from a volatile halocarbon liquid such as 1,1,2 trichloro-1,2,2 trifluoro ethane. The silane, after evaporation of the liquid, coats the composition and polymerizes on contact with water or water vapor to form a water impermeable film and this renders the composition insensitive to water deactivation.

3,786,752

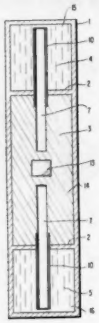
EXPLOSIVE CHARGE WITH IMPROVED FRAGMENTATION EFFECT

Paul Lingens, Leverkusen, and Garhard Martin, Troisdorf, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed July 26, 1971, Ser. No. 166,191
Claims priority, application Germany, July 25, 1970, 2036977
Int. Cl. F42b *3/00;* **F42b** *13/48*
U.S. Cl. 102—24 R **22 Claims**

An explosive charge and method for producing increased fragmentation per unit weight of explosive by providing hollow bodies or cavities adjacent the explosive and connected to the explosive by means of a pipe. The explosive includes a

channel communicating with the pipe. Any number of hollow bodies, spaced at any desired distance from the explosive, may



be employed. The channel preferably is cylindrical or annular. Each hollow body may be filled with a gas, liquid or solid medium or be under vacuum.

3,786,753

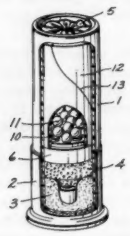
WAD COLUMN FOR SHOTSHELLS

George R. Eckstein, Fairfield, and Lavern S. Bayard, Decon, both of Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Continuation-in-part of Ser. No. 168,681, Aug. 3, 1971, abandoned. This application July 24, 1972, Ser. No. 274,615

Int. Cl. F42b *7/08*

U.S. Cl. 102—42 C **10 Claims**



This invention relates to a wad column for shotshells which tends to protect both the shotshell and the bore of the gun from abrasion or plastic deformation as the result of the passage of shot therethrough and is particularly applicable to use with ferrous metal shot. In its preferred embodiment the wad column comprises a gas sealing wad which acts as a piston to push a charge of shot out of the shell and through the barrel in combination with a shot enclosing sleeve formed from a section of material having physical characteristics such as those of biaxially oriented plastic tubing and which substantially resists penetration by shot pellets. This sleeve is so formed that it is capable of changing readily in its diameter to conform to diametral changes in the passageway from the shotshell and through the barrel but is designed to avoid opening a gap to permit the shot contained therein to contact the gun barrel. A refinement of the invention involves the use of a gas sealing wad which is so shaped that it functions to minimize the opportunity for shot pellets to arrange themselves in close packed, layered, and mechanically rigid conformations.

With all of the features of the invention combined, the column of shot pellets tends to conform generally to the changes in the dimensions of the passage from the shotshell through the bore of the gun in a relatively fluid-like manner, and tends to minimize both abrasion of the surface of the shotgun barrel and plastic deformation of the choked section of the shotgun barrel.

3,786,754

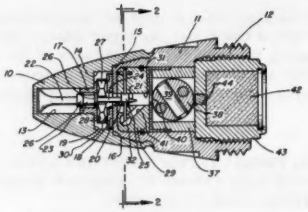
FIRING DELAY FOR POINT DETONATING FUZE

William J. Donahue, Takoma Park; Peter D. Gratton, Simpsonville; Thomas A. Cammack, Beltsville, and Robert L. Schmidt, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 20, 1968, Ser. No. 788,984

Int. Cl. F42c *15/22*

U.S. Cl. 102—79 **9 Claims**



A mechanical delay for point detonating fuzes for projectiles to allow penetration into aircraft or similar light target structures before detonation of the projectile. A trans-axial inertial firing pin is mounted within the projectile so that the centrifugal force exerted thereon by the spinning projectile during light target penetration will selectively determine the firing time delay. Alternatively, instantaneous detonation is provided by a second, axial firing pin when the projectile strikes an impenetrable target or one of such hardness that would break up the projectile before the trans-axial firing pin could react to provide the normal delayed detonation.

3,786,755

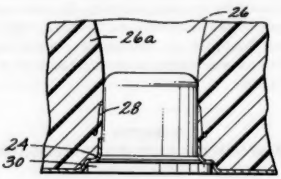
PLASTIC CARTRIDGE CASING

George R. Eckstein, and William G. Moyher, both of Fairfield, Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Nov. 18, 1971, Ser. No. 199,913

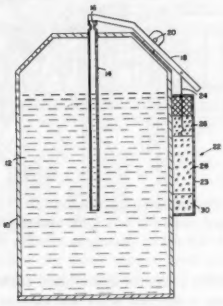
Int. Cl. F42b *7/06*

U.S. Cl. 102—43 P **4 Claims**



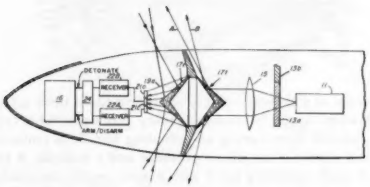
A method of making a one-piece plastic shotgun shell, i.e., where the transverse base portion is integral with the tubular body portion. A tubular plastic slug is carried progressively through a series of dies to produce a shotgun shell having a body portion which is highly oriented and a head section of somewhat lesser orientation. An oriented, integral primer gas seal skirt is formed inside the primer opening.

3,786,756
GASEOUS GRENADE
Lonnie L. Looger, 1104 Mahon Dr., Madison, Ala.
Filed Nov. 15, 1972, Ser. No. 306,787
Int. Cl. F42b 27/02, 27/04
U.S. Cl. 102—65 2 Claims



A grenade for use in dispensing a vaporized explosive mixture in the atmosphere of a winding tunnel and igniting the mixture. The grenade provides a storage compartment for the pressurized explosive mixture and a separate compartment for elements of a delay ignitor. An operating mechanism, releases the pressurized mixture and actuates the delay ignitor for setting off the explosion of the vaporized mixture.

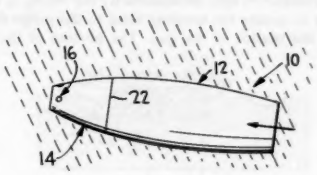
3,786,757
OPTICAL LENS ARRANGEMENT
Irving Goldstein; Gary G. Hayward, both of Lexington, and Jon G. Holt, Woburn, all of Mass., assignors to Raytheon Company, Lexington, Mass.
Filed June 22, 1972, Ser. No. 265,131
Int. Cl. F42c 13/02, 13/00, 19/00
U.S. Cl. 102—70.2 P 4 Claims



An improved optical lens arrangement providing arming and detonating signals for a proximity fuse is shown. The illustrated lens arrangement includes a reflecting surface generally in the shape of a right circular cone, such surface effectively being faceted so that two conical detection fields are formed. Also disclosed are logic and control circuits for processing optical signals from targets in either or both detection fields to differentiate between true and spurious targets.

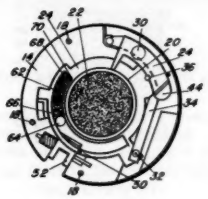
3,786,758
RAIN DISCRIMINATING FAST ACTING IMPACT SWITCH
Thomas H. Zimmerman, Seneca, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sept. 27, 1972, Ser. No. 292,596
Int. Cl. F42c 5/00, 3/00; H01h 35/24
U.S. Cl. 102—70.2 R 4 Claims

A number of spring-mass switches are located around a circumferential line near the forward end of a missile. The switches are connected in series so that detonator energization occurs only when all switches are closed simultaneously. Due to the random nature of rain, all the switches are statistically



restricted from being actuated simultaneously by rain. However, when the missile impacts with a large water body, all switches will close simultaneously to effect a fast acting detonation.

3,786,759
SELF-DESTRUCT FUZE
George P. Mellen, Wayzata, and William A. Schuster, Hopatcong, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 27, 1972, Ser. No. 309,864
Int. Cl. F42c 9/04
U.S. Cl. 102—71 5 Claims

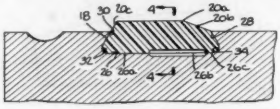


A self-destruct fuze for exploding dud projectiles that fail to function upon impact with a ground target. The fuze utilizes three separate locking devices which are each responsive to acceleration environments that a projectile experiences in a normal launch in order to keep the fuze in a safe unarmed position. A spin rotor and dashpot delay assembly cooperates to hold the fuze in an unarmed state in the event that the projectile has not seen the minimum normal spin environment. If the projectile has experienced a normal firing, but has failed to explode on impact with the target, the present invention will cause the dud to explode.

3,786,760
ROTATING BAND FOR PROJECTILE
Fritz K. Feldmann, Santa Barbara, Calif., assignor to Pacific Technica Corporation, Santa Barbara, Calif.
Filed June 1, 1972, Ser. No. 258,558
Int. Cl. F42b 31/00
U.S. Cl. 102—93 7 Claims

The present invention relates to the use of plastics for rotating bands on projectiles fired from rifled gun barrels. The

plastic band is injection molded into a circumferential channel provided in the projectile body. The cross section of the circumferential channel is designed such as to provide a tight gas seal between the plastic rotating band and the projectile body, to assure transfer of spin introduced by the rifling in the gun barrel and to secure the rotating band to the projectile after exit from the muzzle of the gun. The portion of the plastic



rotating band protruding beyond the projectile body engraves and is compressed into the rifling groove of the gun barrel, thus obturating the propellant gases and transmitting the spinning motion to the projectile. The plastic rotating band is lighter and costs less than conventional metallic rotating bands and is, in addition, a noncritical war material. Furthermore, its use yields better obturation and reduced barrel wear than is obtained with conventional rotating bands.

3,786,761

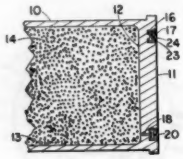
CARTRIDGE IGNITION SYSTEM

Thomas Q. Ciccone, Cornwells Heights; George F. Hare, Feasterville, and Osyp Nimylowycz, Philadelphia, all of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1972, Ser. No. 266,956

Int. Cl. F42b *5/32, 5/36;* **F42c** *19/10*

U.S. Cl. 102—45 **3 Claims**



A rim-fire ignition system in which a ring-type primer is provided in an annular receptacle adjacent the periphery of the rearward end of the large caliber cartridge case. The primer is an annulus of extruded ignition material and preferably includes an extruded aluminum sheath surrounding a fixed core load of priming mixture that can be ignited by an offset firing mechanism.

The arrangement assures good quality control of the primer charge weight from cartridge to cartridge.

3,786,762

TRANSPORTATION SYSTEM ELECTRICAL POWER DISTRIBUTION

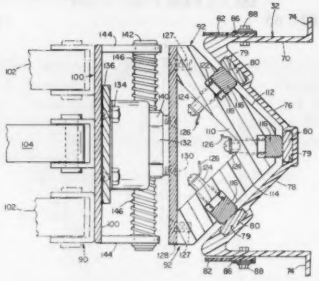
James L. Corkum, Enfield, Conn.; David Schoepflin, Newburyport, Mass., and Paul A. Taylor, East Hartford, Conn., assignors to Alden Self-Transit Systems Corporation, Bedford, Mass.

Filed Mar. 5, 1971, Ser. No. 121,263

Int. Cl. B60l *5/00*

U.S. Cl. 104—148 R **21 Claims**

A transportation system includes two power sources that extend along opposite sides of a right of way for an electrically powered vehicle. Each power source includes an elongated open side housing of electrically insulating material that defines a channel having opposed inner surfaces disposed at an angle to one another and tapering inwardly. A power conductor is disposed in each inner surface and a third power conductor is located at the innermost end of the channel substantially midway between the two inner surfaces. Each vehicle in-



cludes two power collector assemblies, each power collector assembly having a tapered head that carries three conductor members and is arranged for sliding engagement with the power source on its side of the vehicle.

3,786,763

PNEUMATIC SUSPENSION AND CONTROL SYSTEM FOR RAILWAY VEHICLES

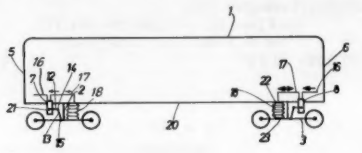
Hans Pollinger, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Feb. 25, 1971, Ser. No. 118,886

Claims priority, application Germany, Feb. 26, 1970, 2009025

Int. Cl. B60g *21/06;* **B61f** *5/10, 5/24*

U.S. Cl. 105—199 R **7 Claims**



The body of a railway vehicle is supported on both sides by air bellows mounted between the body and a pivotable truck. An air control valve having an actuating handle is connected between a source of air under pressure and a bellows. A lever connects each actuating lever with a point on the longitudinal side of a truck, the points on the truck being horizontally displaced with respect to each other as the truck pivots with respect to the vehicle body as the vehicle moves along a curved path. The pivotal movement of the truck causes movement of the lever which actuates the control valves to increase the pressure in the bellows on the outside of the curve and to decrease the pressure in the bellows on the inside of the curve to tilt the vehicle toward the inside of the curve.

3,786,764

RAPID DISCHARGE HOPPER CAR

Albert Alvin Beers, Jr.; Paul Eugene Stoyer, and Joseph Campbell Lightner, Jr., all of Greenville, Pa., assignors to Greenville Steel Car Company, Greenville, Pa.

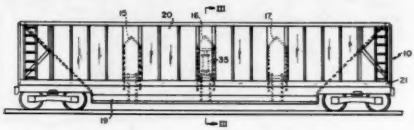
Filed May 17, 1972, Ser. No. 253,977

Int. Cl. B61d *7/02, 7/18, 7/28*

U.S. Cl. 105—240 **6 Claims**

The rapid commodity discharge car contains no center sill along the car bottom opening and the longitudinally spaced hoppers are closed by a pair of doors which overlap in the closed position along the longitudinal center line. The doors

are mounted to door hangers pivotally connected in the spaces between the various hoppers of the car. The doors are actuated by a vertically disposed air cylinder and rack and pinion assembly which is also located in the space between the hoppers. The rack and pinion connect to a linkage assembly which



locks in both the open and closed position. The various pivot points of the linkage assembly and the door hangers are positioned so that the centers of gravity of the car doors are vertically disposed below the door hanger pivot points when the linkage is in its position of least mechanical advantage.

3,786,765

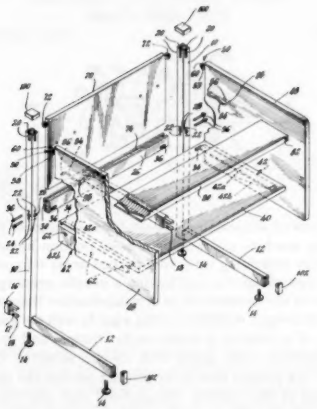
CARREL CONSTRUCTION

Alan Carleton Burr, East Norwalk, Conn., assignor to Howe Folding Furniture, Incorporated, New York, N.Y.

Filed Feb. 28, 1972, Ser. No. 230,001

Int. Cl. A47b *57/00*; **F16b** *12/00*

U.S. Cl. 108—60 **7 Claims**



Carrel system support framework comprising pairs of uprights and interconnecting cross members, is formed by inserting through the uprights pins with circumferentially grooved ends adapted to enter and engage the end of an opposed cross member or members; one or more horizontal planar members are supported in cantilever fashion from a cross member by hook and slot interconnections; backs with laterally protruding headed hanger pins are hung between pairs of uprights the upper ends of which are slotted to receive the hanger pins; side panels each with a headed hanger pin projecting from one end are supported from the uprights respectively by inserting the hanger pins in other slots in the upper ends of the uprights; and shelves with recessed ends are supported by and between spring-wire brackets which are assembled in opposed relation on the opposed faces of a pair of side panels, or a side panel and a back of one carrel which is acting as a side panel of another carrel.

3,786,766

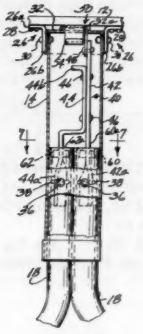
COLLAPSIBLE TABLE

Ned Chiariello, 454 Tower Lawn Dr., Burlington, Wis.

Filed Sept. 15, 1972, Ser. No. 289,725

Int. Cl. A47b *3/00*

U.S. Cl. 108—115 **10 Claims**



A collapsible table comprising a pivotable tabletop mounted at the upper end of a standard to which one, or more, movable legs are secured. Leg actuating means, having a twisted, flat-surfaced, movable leg-engaging portion, connects the pivotable tabletop with means on said one, or more, movable legs which coacts or cooperates with the flat surfaces of the leg-engaging portion to move the movable leg, or legs, from a collapsed position to an extended position when the pivotable tabletop is pivoted from a position of non-use to a position of use. The table may be used as a stand for a movie or slide projector, as a game table, as a snack table, or the like.

3,786,767

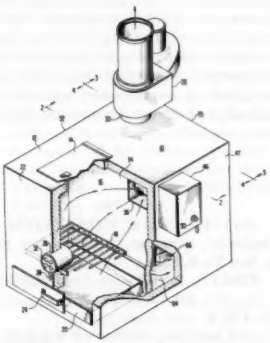
INCINERATOR TYPE ENVIRONMENTAL CONTROL SYSTEM

William H. Schwartz, Jr., 7221 Ash Ave., Gary, Ind., and Billy D. Maxwell, 3548 Delaware St., Gary, Ind.

Division of Ser. No. 46,937, June 17, 1970. This application Apr. 5, 1972, Ser. No. 241,225

Int. Cl. F23g *5/12*

U.S. Cl. 110—8 A **7 Claims**



A relatively small and compact system for cleaning and purifying products of combustion resulting from incineration of waste materials including smoke and particles suspended therein as well as gases produced thereby wherein all of the products of combustion are forced from a first burning

chamber into a balanced flow system including a second burning chamber having a burner flame completely enveloping the input thereto for incinerating the smoke, etc. to a substantially clean, hot exhaust gas.

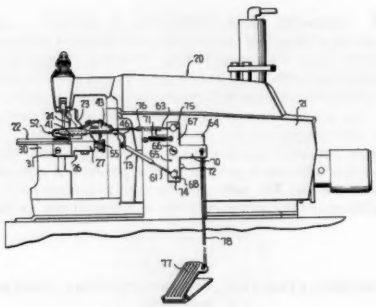
The extremely hot exhaust gases are fed into a temperature reduction labyrinth having several direction changes while maintaining the constant volumetric flow therethrough and finally through a scrubbing stage including a water bath, a series of water sprays and an output baffle while still maintaining the constant volumetric flow for completely removing any other products remaining in the exhaust gases thereby reducing air pollution to substantially a zero level.

3,786,768

AUTOMATIC HEMMING APPARATUS

Robert L. Kosrow, Hoffman Estates, and Aloizy Mrowczynski, Des Plaines, both of Ill., assignors to Union Special Machine Company, Chicago, Ill.

Filed Oct. 20, 1971, Ser. No. 190,757
Int. Cl. D05b *35/04*
U.S. Cl. 112—143 **24 Claims**



This disclosure relates to an automatic hemmer which includes a conventional overedge sewing machine having special support and hem folding apparatus associated therewith. The hem folding apparatus includes means for assuring the elimination of a curl in advance of the hem folder, means for controlling movement of the material in advance of the hem folder, an ejector, and hem detecting means whereby the various components of the hem folding attachment and the operation of the sewing machine may be automatically controlled. The support apparatus may include means for supporting tubular material, such as an undershirt, whereby a continuous hem along one edge of the tubular material may be automatically sewn.

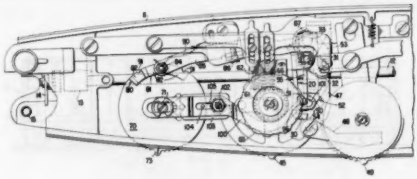
3,786,769

PATTERN SELECTION SYSTEM

Lionel J. Coulombe, Matawan, N.J., assignor to The Singer Company, New York, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,499
Int. Cl. D05b *3/02*
U.S. Cl. 112—158 A **3 Claims**

A pattern cam selecting mechanism which is operated by turning movement of a dial and includes a cam follower retracting linkage effective during the angular movement of the dial between positions in which the various pattern cams are selected. The cam follower retracking linkage is constructed so as to utilize in either direction of dial movement much more than half the angular movement of the dial between successive positions of cam selection for retracting the cam follower. As a result, the magnitude of forces required



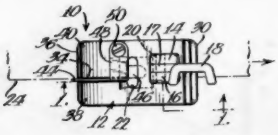
to effect cam selection may be reduced or for the same magnitude of forces, a smaller angle of turning movement of the cam selecting dial need be required.

3,786,770

OVERCASTING FOOT ATTACHMENT FOR SEWING MACHINES

Naoichi Nishi, Sanjo, Japan, assignor to Brewer Sewing Supplies Company, Chicago, Ill.

Filed Jan. 20, 1972, Ser. No. 219,448
Int. Cl. D05b *29/00*
U.S. Cl. 112—235 **2 Claims**



An improved overcasting presser foot attachment for a zigzag sewing machine comprising a body portion having a pair of forwardly extending upwardly curved arms separated by a narrow longitudinal slot and having a needle opening located at the rear of the narrow slot in communication therewith, and a guide and tongue member having a guide wall for guiding the raw edge of a piece of material to be stitched and an integral tongue member, said guide and tongue member being attached to the presser foot body portion so that the guide wall is disposed in the narrow longitudinal slot and the tongue member projects rearwardly beneath the needle opening so as to bisect the latter.

3,786,771

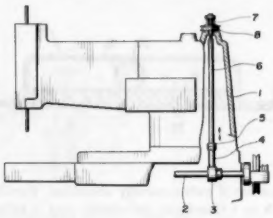
MEANS FOR IMPARTING TENSION TO THE DRAWN-OUT THREAD FOR SEWING MACHINES

Mitsuo Matsumoto, Tokyo, Japan, assignor to Nara Mishin Kogyo Kabushiki Kaisha, Tokyo, Japan

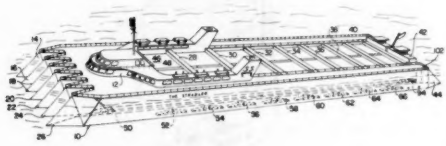
Filed Dec. 28, 1971, Ser. No. 213,080
Claims priority, application Japan, May 13, 1971, 46-31575
Int. Cl. D05b *47/00*
U.S. Cl. 112—255 **3 Claims**

According to the invention, the drawn-out thread of a sewing machine is guided between a roller having a thread releasing notch formed in part of the roller periphery and a thread

urging member urged against the roller periphery, with the roller rotated in the direction opposite to the direction of withdrawal of the thread, so that the thread can be effectively rendered taut and loose alternately by the co-operation of the roller and thread urging member.



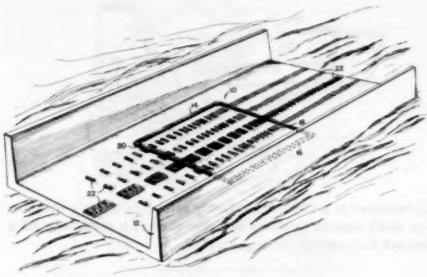
3,786,772
CATAMARAN SHIP'S STRUCTURE
Frank Broes, McLean, Va., assignor to Stradco Inventions & Research Co., Washington, D.C.
Filed May 2, 1972, Ser. No. 249,595
Int. Cl. B63b *35/28*
U.S. Cl. 114—43.5 **10 Claims**



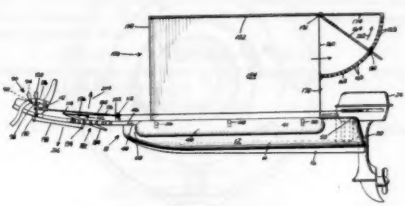
A catamaran type vessel having a plurality of longitudinally extending hulls defining longitudinal propulsion channels intermediate said hull form and one or more elevators vertically liftable intermediate the hulls, so as to vary the height of the elevator with respect to the surface of the water. As a result, the ship may be used for the transport of cargo in a variety of vertical attitudes, as well as a dry dock. The elevator may be supported above the surface of the water or it may be lowered to permit the floating in of another vessel prior to dry docking operation.

3,786,773
HYDROCARBON RETAINER FOR DRYDOCKS
Paul Preus, P.O. Box 1002, Toms River, N.J.
Filed Sept. 28, 1972, Ser. No. 292,887
Int. Cl. B63c *1/02*
U.S. Cl. 114—45 **8 Claims**

A device placed on the floor of a drydock to encompass the damaged area of the hull of a ship drydocked therein, intercepts the flow of water from the area of the hull during drydocking to filter out hydrocarbons eminating from the damaged hull to preclude contamination of the waters surrounding the drydock and the drydock itself.



3,786,774
AIRBOAT
William A. Gabel, Rt. 8, Huntington, Ind.
Filed Aug. 21, 1972, Ser. No. 282,495
Int. Cl. B63b *1/18*
U.S. Cl. 114—66.5 R **7 Claims**

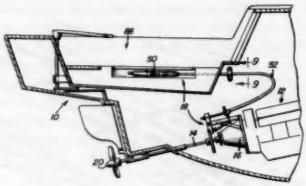


A watercraft comprising a planing hull, means for propelling the hull through the water, and at least one seat mounted on the hull adjacent to the forward end thereof. A first airfoil means including a device resembling a large box-kite is mounted on the hull for lifting the hull partially out of the water in response to air flow pressure against the ceiling of the box-kite as the hull moves forwardly and a second airfoil means is pivotably mounted forwardly of the hull and movable between upwardly and downwardly tilted positions for applying a selected amount of lift thereto. Control means are mounted adjacent the seat for controlling the speed and direction of the propelling means and the tilted position of the second airfoil means.

3,786,775
SHAFT LOCK
Norman M. Sarns, Bass Harbor, Maine
Filed Feb. 25, 1972, Ser. No. 229,448
Int. Cl. B63b *9/00*
U.S. Cl. 115—0.5 R **12 Claims**

A shaft lock particularly for auxiliary sailboats and the like has a split flanged-collar clampable to a rotatable shaft provided with a pair of opposed recesses. A pivotally mounted latch member is arranged adjacent the flanged collar for selectively cooperating with the recesses in holding the shaft in one of two opposed positions. A lever member is connected to the

latch member by means of a cable for selectively moving the latch member in cooperative engagement with a recess. The



lever member is arranged for freely releasing upon a rotation of the shaft from a position wherein the latch member and a recess are in cooperative engagement.

3,786,776

ALARM DEVICE ON A CLUTCH

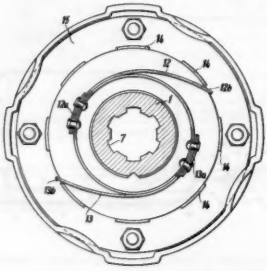
Theo Buthe, and Manfred Kugler, both of Lohmar/Rheinl, Germany, assignors to Jean Wallerscheild, GmbH, Lohmar/Rheinl, Germany

Filed Sept. 5, 1972, Ser. No. 286,278

Claims priority, application Germany, Jan. 14, 1972, 7201226

Int. Cl. G08b *3/00*

U.S. Cl. 116—67 R **5 Claims**



The clutch is provided with a driven hub on which is mounted a sleeve having a number of leaf springs attached in such a manner that the free ends of the springs are freely moveable and the springs are positioned at an increasing radial distance from the periphery of the sleeve. The clutch housing as the driven member, is provided with a ring having a plurality of axial extensions which are engaged by the free ends of the leaf springs. Relative movement between the driven and driving members causes the free ends of the leaf springs to move rapidly over the axial extensions and produce an audible signal indicating the relative movement.

3,786,777

IRREVERSIBLE WARM-UP INDICATOR

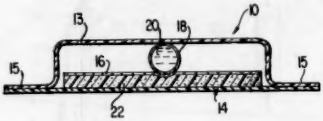
Robert W. Smith, Oakton, Va.; Fred Ordway, Bethesda, Md.; Charles A. Taylor, Falls Church, and William Zimmerman, III, Alexandria, both of Va., assignors to Artech Corporation, Falls Church, Va.

Filed Dec. 31, 1970, Ser. No. 103,146

Int. Cl. A23 ; **G01d** *21/00*

U.S. Cl. 116—114 AB **19 Claims**

An indicator for use with a refrigerated object to indicate visually that the object has rewarmed and to warn of possible spoilage. The indicator includes a transparent package housing a frangible container filled with a liquid that expands on freezing and an indicator material placed in proximity thereto which will undergo a color change when contacted by the liquid. The liquid freezes when refrigerated along with the object and expands fracturing the container which previously prevented communication between the liquid and indicator material. Rewarming of the object causes the liquid to melt and contact the indicator material to record by a change of color in the indicator material the fact that the object has



rewarmed, even if subsequently recooled. Resilient pressure means, such as a foam pad, an elastic ring, a helical compression spring, a compressed gas bag, an indenter, resilient tongues formed in the indicator material, or equivalent structure is provided in the package between the container and a wall of the package to assure liquid flow from the container in the event of its incomplete or local fracture.

3,786,778

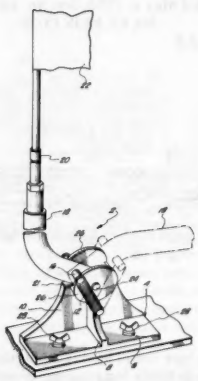
SIGNAL DEVICE FOR WATER SKIING

Steven Wayne Palmer, 118 Glendora Ave., Long Beach, Calif., and Gary Ross Palmer, 1348 Seventh St., Santa Monica, Calif.

Filed Sept. 18, 1972, Ser. No. 290,118

Int. Cl. G08c *5/00*

U.S. Cl. 116—132 **8 Claims**



A pivotable flag or signal device for water skiing is provided to warn other boats when a skier is down in the water. An over centered spring mechanism securely positions the signal device in either an operative upright position or a storage horizontal position. The signal device is mounted on an extendable shaft for varying the height of the signal device and to insure a compact storage in an inoperative position.

3,786,779

OVERHEAD RAIL CLEANER AND OILER

Roger L. Brunel, Grove City; Robert D. Fannon, and Ronald L. Legue, both of Columbus, all of Ohio, assignors to Klenco Corporation, Massilon, Ohio

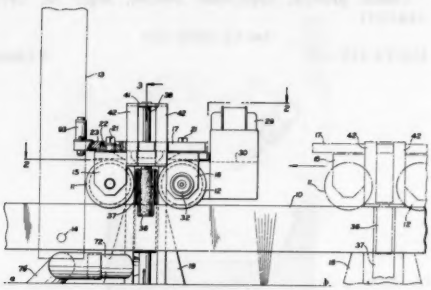
Filed Sept. 13, 1972, Ser. No. 288,870

Int. Cl. B05c *5/00*; **E01h** *8/00*

U.S. Cl. 118—4 **11 Claims**

An automatic cleaner for overhead conveyor rails comprising a motor-driven carriage riding on the rail. The machine

has vertically disposed axially rotatable brushes for cleaning opposite sides of the rail and a suction device for collecting dirt removed by the brushes. The brushes are vertically adjustable to avoid interference with rail switches and with rail hanger brackets and their rivet heads. An oil spray system mounted on the machine behind the brushes coats the cleaned surfaces of the rail to inhibit corrosion.



3,786,780

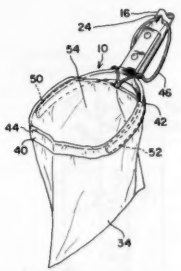
PORTABLE CANINE TOILET

Carmine Pezzino, 251 Westminster, Brooklyn, N.Y.

Filed Apr. 3, 1972, Ser. No. 240,505

Int. Cl. A01k *23/00;* **A47f** *13/06*

U.S. Cl. 119—1 **1 Claim**



As a portable canine toilet, in combination a holder and disposable waste receiving means adapted to be removably fitted upon the holder. The holder has a projecting means mounted on its rod portion, and the receiving means has a partially circumferential sleeve along its upper portion and into which the lower part of the holder is inserted. The receiving means also has a stringed collar at the top of the upper portion, the protruding portion of the string normally positioned on the projecting means.

3,786,781

TURTLE TRAY AND HOOD (A NATURAL HABITAT)

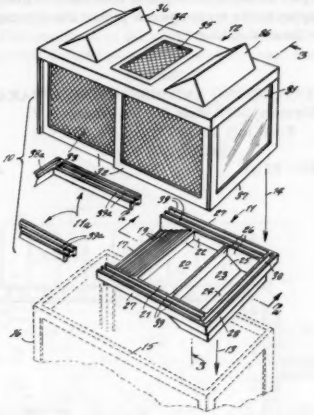
Gene M. Poulsen, 5455 Sheffield Ct. Apt. 52, Alexandria, Va.

Filed July 24, 1972, Ser. No. 274,397

Int. Cl. A01k *64/00*

U.S. Cl. 119—5 **1 Claim**

An enclosure for placement upon a conventional aquarium tank such as is used in a home for tropical and other fish, the enclosure comprising a tray upon which turtles may climb from the aquarium water, and a hood that is placeable over the tray so to present the turtles to escape, the hood accordingly including sliding access doors on a front side for servicing the tray area, the front and sides of the hood having viewing windows, and a top of the hood having lamps directing light rays downwardly on the tray and aquarium tank.



3,786,782

MILK FLOW SENSING VALVE FOR TEAT CUP RELEASE

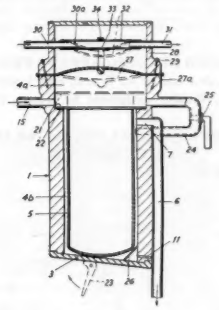
Walter Frank Abrahamson; John Hougham Abrahamson, and Boris Hougham Abrahamson, all of R. D. 6, Otorohanga, New Zealand

Filed June 30, 1972, Ser. No. 268,122

Claims priority, application New Zealand, June 30, 1971, 164144; Mar. 3, 1972, 166474

Int. Cl. A01j *5/04*

U.S. Cl. 119—14.08 **5 Claims**



A milk flow sensing valve unit particularly for location in a milk line to a set of teat cups and whereby vacuum supply to the teat cups can be cut off, or at least substantially reduced, to effect release of the teat cups from the animal upon cessation or substantial reduction in milk flow from the animal. The sensing valve unit including a hollow body defining a milk receiving float chamber housing a float member which is arranged to actuate and hold open valve means on filling of the chamber with milk from the teat cups to permit milk discharge through a main outlet to which vacuum is applied. A secondary or drain outlet is provided for emptying the chamber after cessation of milking and the arrangement providing that the float member will hold the valve means open whilst there is full milk flow from an animal in excess of the milk flow permitted through the secondary or drain outlet, but when the

milk flow from the animal into the chamber falls below the flow rate through the secondary or drain outlet, the float lowers to close the valve means and shut off vacuum supply to the upper part of the chamber and milk inlet to thus shut off vacuum supply to the teat cups and permit the teat cups to fall away from the cows udder.

3,786,783

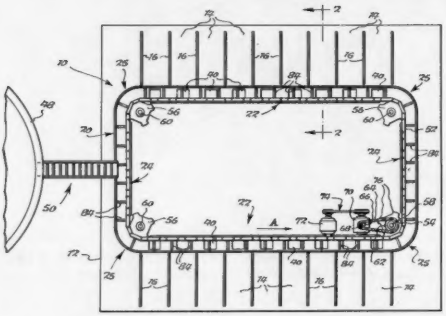
FEED CONVEYING AND DISPENSING APPARATUS

Terryl J. Ripstein, 2478 Main St., Varysburg, N.Y.

Filed July 12, 1972, Ser. No. 270,937

Int. Cl. A01k *5/00*

U.S. Cl. 119—52 AF **4 Claims**



An endless trough is suspended in an elevated, generally horizontal plane above and slightly forward of the front ends of a plurality of stalls disposed in spaced-apart rows. A plurality of transversely extending paddles, carried by an endless drive chain, convey feed material through the trough. Openings are provided in the trough bottom wall for dispensing the feed material to livestock confined within the stalls. Slide gates are associated with the openings for selectively closing such openings or varying the sizes thereof.

3,786,784

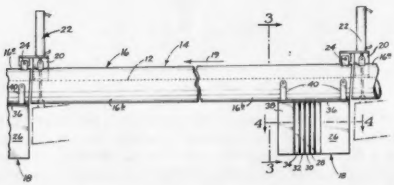
FISH FEEDING APPARATUS

Eugene W. Dils, Jr.; Larry A. Ward, and Robert A. Ward, all of Vancouver, Wash., assignors to Garon Company, Vancouver, Wash.

Filed July 3, 1972, Ser. No. 268,463

Int. Cl. A01k *5/00*

U.S. Cl. 119—51 R **8 Claims**



A conduit system in fish feeding apparatus including plural end-to-end disposed conduit sections which, when in communication with one another, define an elongated flow path for feed. Each conduit section is pivoted adjacent its intake end to permit selective downward swinging of its discharge end to dispense feed out of the flow path. Adjacent the discharge end of each such conduit section, and positioned beneath the flow path, is a multi-vaned diffuser which, with the discharge end of the associated conduit section lowered, diffuses feed dispensed from such end.

3,786,785

WATERING VALVE

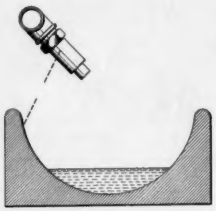
Jarl Rune Olde, Laduagen 4, Uppsala, Sweden

Filed Oct. 2, 1972, Ser. No. 294,372

Claims priority, application Sweden, Sept. 30, 1971, 12410/71

Int. Cl. A01k *7/00*

U.S. Cl. 119—75 **4 Claims**



A watering valve for animals including a valve device and a water outlet to be placed above a feed trough for supplying water out over a large area of the feed in the trough. The actuable end of the valve stem being on such a distance from the water outlet that an animal cannot actuate the valve and drink of the water simultaneously.

3,786,786

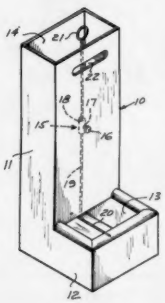
ANIMAL FEEDER

Leif H. Gravos, Arnegard, N. Dak.

Filed Nov. 1, 1972, Ser. No. 302,747

Int. Cl. A01k *5/00*

U.S. Cl. 119—52 A **1 Claim**



A feeder for small pigs that stores food in a vertical container. Food deposited in a top opening is taken by the animals at a bottom opening. An integrally built agitator is manually operated from time to time to move the food to the bottom opening.

3,786,787

DEVICE FOR DISPOSING OF DOG DROPPINGS

Morton Weinberger, 1023 S. Carley Ct., North Bellmore, N.Y.

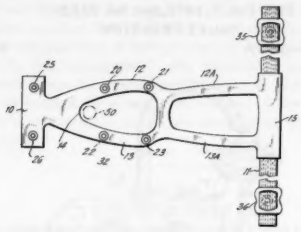
Filed Jan. 2, 1973, Ser. No. 320,672

Int. Cl. A01k *23/00*

U.S. Cl. 119—95 **4 Claims**

A harness and bag device for dogs and similar pets is described of which at least the bag portion thereof is disposable. The harness includes cooperating back and belly strip means which are connectable to encircle the dog at the girth, and a pair of bag-carrying strap means extending from the

back strap to the belly strap and adapted to pass inside the hind legs of the dog. Bag means is provided integrally with, or attachable to, the pair of bag-carrying strap means and connection is provided between the straps to locate the back strap



with respect to the tail and thereby to properly position the bag for catching the dog droppings. The bag is formed on or attached to the bag-carrying straps in such a way as not to interfere with the dog's movement, or to tightly cover any part that the dog may try to lick, scratch or bite.

3,786,788

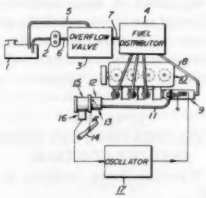
FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINE

Toshi Suda, Nagoya, and Hideya Fujisawa, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Aichi-ken, Japan

Continuation-in-part of Ser. No. 64,766, Aug. 18, 1970, abandoned. This application May 24, 1972, Ser. No. 256,256

Int. Cl. F02m *51/00*

U.S. Cl. 123—32 EA **2 Claims**



In a fuel injection apparatus for an internal combustion engine, including a fuel pump for feeding fuel from a fuel tank to a fuel distributor, an overflow valve for regulating the pressure of the fuel in said fuel distributor and solenoid valves provided in the same number as the number of cylinders of the engine and connected to said fuel distributor to act as fuel injection valves, said solenoid valves are driven by a variable frequency oscillator and the frequency of said variable frequency oscillator is controlled in accordance with the average quantity of air sucked by the engine per unit time and further said solenoid valves are opened and closed by means of a pulse row independent of the engine speed.

3,786,789

ELECTRONIC FUEL INJECTION SYSTEM HAVING COARSE AND FINE SPEED COMPENSATION

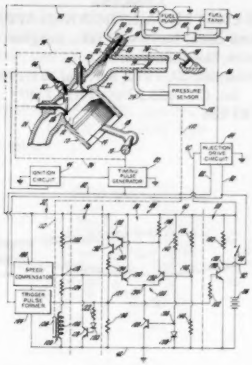
Paul N. Barr, Kokomo, Ind., and Tim G. Jagodzinski, Troy, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1971, Ser. No. 198,749

Int. Cl. F02d *5/02*; **F02m** *51/00*

U.S. Cl. 123—32 EA **8 Claims**

Fuel is applied to an internal combustion engine in an amount determined by the length of the control pulses produced at a frequency proportional to the speed of the engine. The length of the control pulses is determined as a function of at least one engine operating parameter. In addition, the length of the control pulses is determined in response to the amplitude of a speed voltage during each of the control pulses. The amplitude of the speed voltage linearly varies over a time period defined as a function of the total time interval



between the termination of successive control pulses thereby to provide coarse speed compensation. Further, the slope or the rate of change in the amplitude of the speed voltage is defined as a function of engine speed thereby to provide fine speed compensation. Preferably, the rate of change in the amplitude of the speed voltage is altered such that the length of the control pulses is approximately linearly released to the speed of the engine.

3,786,790

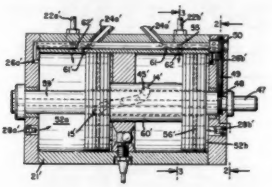
DOUBLE-CHAMBERED RECIPROCATABLE DOUBLE-ACTION-PISTON INTERNAL COMBUSTION ENGINE

Joseph B. Plevyak, 19 Jefferson St., Newton, N.J.

Filed Aug. 3, 1972, Ser. No. 277,687

Int. Cl. F02b *75/26*, *75/28*

U.S. Cl. 123—58 C **11 Claims**



An internal combustion engine having two piston chambers in series with interconnected pistons for synchronous reciprocating motion, the combustion-expansion cycle of one cylinder serving to return the other piston to the fuel-compression state, there being an intermediate compression and ignition chamber between the opposing piston cylinders and pistons with a valve means mounted within the piston cylinder such as a spherical ball movable between and sealable alternately of opposite-end openings of the ignition chamber opening into the opposing piston cylinders and the movement of the spherical ball valve being dependent upon return-movement of the piston bringing about compression of gases adjacent the ball thereby forcing the ball out of the vent toward the distant end of the ignition cylinder away from the approaching piston, to seal the far end of the ignition chamber,

whereby as the approaching piston continues to approach and finally to become substantially flush with the piston chamber, gases within the space adjacent the approaching piston and compressed within the ignition chamber prior to ignition by a spark plug or other ignition mechanism within the ignition chamber.

3,786,791

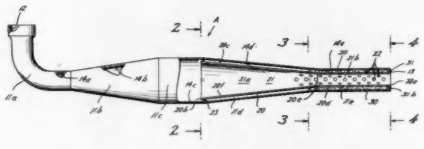
EXHAUST CONTROL METHOD AND APPARATUS

Kay Keith Richardson, Baytown, Tex., assignor to Arthur F. Hoehn, Trustee, Houston, Tex.

Filed Jan. 27, 1972, Ser. No. 221,179

Int. Cl. F02b *27/00*; **F01n** *1/00*

U.S. Cl. 123—65 EM **11 Claims**



An exhaust control method and apparatus for controlling the exhaust flow of an internal combustion engine to increase engine efficiency and power while suppressing the sound of the exhaust by both absorbing and canceling sound waves.

3,786,792

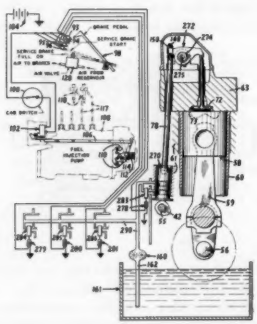
VARIABLE VALVE TIMING SYSTEM

Winton J. Pelizzoni; Jack F. Greathouse; Frank J. Pekar, Jr., and Richard B. Gibson, all of Hagerstown, Md., assignors to Mack Trucks, Inc., Allentown, Pa.

Filed May 28, 1971, Ser. No. 147,833

Int. Cl. F02d *13/04*

U.S. Cl. 123—97 B **36 Claims**



A system for varying the valve timing of an internal combustion engine to increase the retarding effect of the engine for braking purposes, to increase the compression ratio of a relatively low compression ratio engine to enhance starting, and to optimize breathing to improve the engine performance over the useful operating speed range. The valve timing is varied by changing the total valve train length so as to shift the points on the cam profile at which the valve opening and closing events are determined.

3,786,793

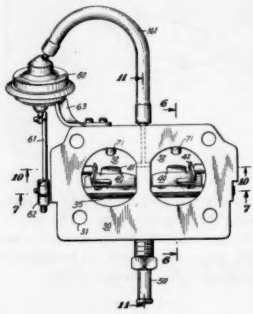
EMISSION CONTROL DEVICE FOR CARBURETOR-EQUIPPED INTERNAL-COMBUSTION ENGINES

Victor C. Bohls, 6391 Brittany Pl., Littleton, and D. Douglas Graham, 2000 W. 92nd Ave., Denver, both of Colo.

Filed Feb. 7, 1972, Ser. No. 223,863

Int. Cl. F02b *33/00*

U.S. Cl. 123—119 A **9 Claims**



An eccentrically pivoted control vane is provided in a bore interconnecting a standard carburetor with the intake manifold of an internal-combustion engine. The shaft of the control vane is connected to a pressure sensitive actuator exposed to the differential between atmospheric and induction manifold pressure levels; the angular position of the control vane being, therefore, sensitive to both engine air mass flow and manifold vacuum. Two inlet ports, for diluting air and recirculating exhaust gas, variably obscured by tabs mounted on the control vane, flow through them depending on the angular position of the latter. A secondary air dilution circuit provides a small flow of air at intermediate manifold vacuum conditions. Emission of harmful pollutants is substantially reduced by the admixture of recycled exhaust gas and of diluting air with the engine propellant charge.

3,786,794

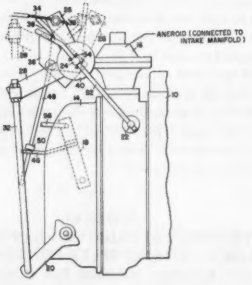
TRIGGER MECHANISM FOR FUEL INJECTION PUMP ANEROID CONTROL

Lewis Kie Davis, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 24, 1972, Ser. No. 309,364

Int. Cl. F02m *63/00*; **F02n** *17/00*

U.S. Cl. 123—139 ST **6 Claims**



A trigger mechanism for the control member of an aneroid on a fuel injection pump assembly includes pivot lever means linked to the fuel shut-off lever of the pump assembly to move the fuel shut-off lever between its off and on positions, pivoted trigger means operatively connected to the control member and extending across the path of movement of the lever means

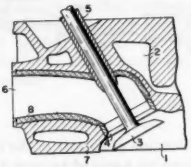
to be engaged and moved by the lever means in a direction to move the control member in a direction to deactivate the aneroid as the lever means is moved in a direction to move the fuel shut-off lever to its off position, and a one-way connection between the speed control lever of the pump assembly and the trigger means to move the trigger means in a direction to move the control member in a direction to activate the aneroid as the speed control lever is moved towards its high-speed position. With this arrangement, the aneroid is automatically deactivated when the engine is shut down so that the engine can be overfuelled for starting and as soon as the speed control lever is advanced to accelerate the engine, the aneroid is again activated.

3,786,795

CYLINDER HEAD

Yasuhisa Kaneko; Yasuhiko Komatsu, and Yasuo Okada, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-cho, Toyota-shi, Aichi-ken, Japan

Filed Nov. 14, 1972, Ser. No. 306,420
Claims priority, application Japan, Nov. 30, 1971, 46-96428
Int. Cl. F02b *23/00*
U.S. Cl. 123—193 H **2 Claims**



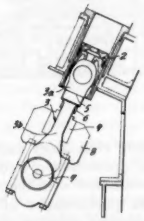
The present invention relates to an improvement in the internal combustion engine, particularly, internal combustion engines for automobiles. More specifically it relates to an improved cylinder head characterized by having the total area of the internal wall of the exhaust port constructed in two-piece fashion, one piece or part being a refractory part solidly enveloped with the other part which is the engine casting. The refractory part is shrink-fitted in the molten metal of the casting so that it can fully withstand repeated cycles of heating and cooling as well as mechanical vibrations.

3,786,796

METHOD AND APPARATUS FOR TAKING OUT PISTON IN TRUNK PISTON ENGINE

Takeo Okazaki, Tokyo, Japan, assignor to Mitsui Shipbuilding and Engineering Company, Ltd. and Japan Ship's Machinery Development Association, both of Tokyo, Japan

Filed Apr. 12, 1972, Ser. No. 243,128
Claims priority, application Japan, May 27, 1971, 46-36822
Int. Cl. F02f *7/00*
U.S. Cl. 123—195 R **6 Claims**



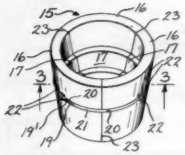
Method of taking the piston from the engine in the internal combustion engine, more particularly in the trunk piston engine, characterized by that the connecting rod is disconnected from the piston and turned to a suitable position in the crankcase, the piston is drawn out of the cylinder to the crankshaft and supported on the crankshaft, and the crankshaft is rotated together with the piston to the position where the piston is taken out of the engine.

3,786,797

VALVE SPRING RETAINER LOCKS AND METHOD OF ASSEMBLING ON A VALVE STEM

Maurice J. Eade, and Charles N. Mellowes, both of Milwaukee, Wis., assignors to Charter Manufacturing Company, Inc., Milwaukee, Wis.

Filed Mar. 31, 1971, Ser. No. 129,791
Int. Cl. F01l *3/10, 3/00*
U.S. Cl. 123—90.67 **4 Claims**



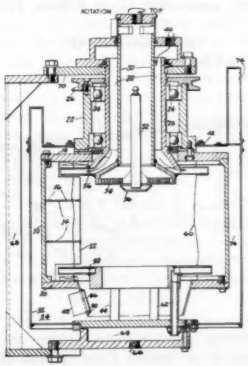
An externally tapered valve spring retainer lock is formed of multiple segments, preferably three in number, which have external circumferential grooves in circumferential alignment to accommodate a yielding ring having separable ends to hold the segments in pre-assembled relationship so that the lock may yield outwardly as it is being slipped onto a valve stem and be held in pre-assembled condition prior to being engaged with the tapered bore of the valve spring retainer. The segments are connected to the ring and maintain the ring in a fixed circumferential position so that one of the end portions of the ring is slideable over a segment during expansion of the lock, with said end so located that it can provide for maximum needed expansion of the lock without having said end enter a joint.

3,786,798

DIRECT FIRED WATER HEATER

Lothar A. Huettner, c/o Inter Continental Corp., 193 W. Boylston St., West Boylston, Mass.

Filed Feb. 22, 1972, Ser. No. 228,290
Int. Cl. F24h *1/10*
U.S. Cl. 126—350 R **11 Claims**



A direct fired water heater comprising a rotary drum, a water inlet and a water outlet therefor, a burner generally cen-

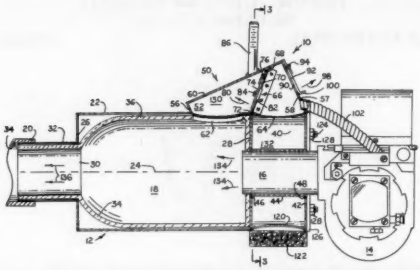
trally located in the drum, the burner being fixed, there being an inlet stator and an outlet stator having openings at different distances from the inner periphery of the drum providing a static pressure difference in the water.

3,786,799

PULSE RELIEF DAMPER

Paul D. Cox, Ridgeville, Ind., assignor to Cox Manufacturing Co., Inc., Ridgeville, Ind.

Filed Feb. 7, 1972, Ser. No. 224,190
Int. Cl. F24c *3/06*
U.S. Cl. 126—91 A **10 Claims**



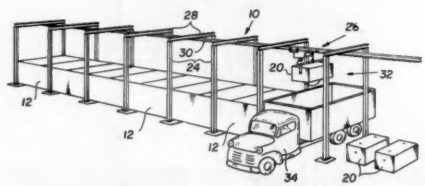
For use with a tube-fired radiant heating system which includes a serially connected fuel combusting device and an elongated, hollow radiant heating tube, a pressure-pulse relief damper comprising a chamber having a first opening therein which communicates with the interior of the radiant heating tube at a point adjacent the fuel combusting device and a second opening therein disposed remotely with respect to the first opening and communicating with the atmosphere. A normally closed, unidirectional valve means is mounted within the chamber for preventing the flow of air through the chamber from the radiant heating tube to the atmosphere and which is responsive to a sub-atmospheric pressure in the radiant heating tube for permitting the flow of air from the atmosphere to the interior of the radiant heating tube.

3,786,800

ASPHALT STORAGE AND LOADING APPARATUS AND METHOD

Anton H. Heller, Levittown, N.Y., assignor to Poweray Infrared Corporation, Farmingdale, N.Y.

Filed July 12, 1971, Ser. No. 161,561
Claims priority, application Great Britain, July 31, 1970, 37155/70
Int. Cl. E01c *19/45*
U.S. Cl. 126—343.5 A **6 Claims**



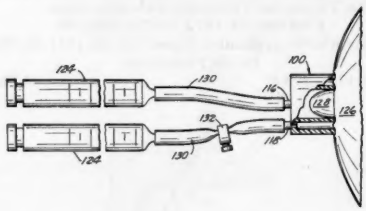
An asphalt storage and loading apparatus advantageously located adjacent to or distant from an asphalt plant and operated independently thereof, said apparatus including plural heated enclosures arranged in side-by-side relation to define an asphalt storage station, and an overhead conveyor arranged to extend along said storage station and also beyond one end thereof so as to define an asphalt loading station, whereby asphalt carriers can be loaded with asphalt by said overhead conveyor.

3,786,801

METHOD AND APPARATUS FOR AIDING IN THE DETECTION OF BREAST CANCER

Otto W. Sartorius, Santa Barbara, Calif., assignor to Diagnostic, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 801,613, Feb. 24, 1969, Pat. No. 3,608,540. This application Sept. 28, 1971, Ser. No. 184,501. The portion of the term of this patent subsequent to Sept. 28, 1988, has been disclaimed.
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 F **2 Claims**



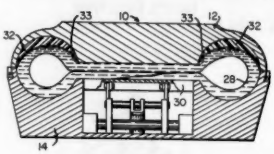
A method for detection of cancer of the breast is provided which comprises drawing a partial vacuum around the area of the breast immediately peripherally surrounding the breast nipple to restrain sphincter contraction of the duct openings in the nipple area, then, while maintaining this first mentioned partial vacuum, intermittently applying a zone of reduced pressure to the nipple itself for the extraction of secretion therefrom in sufficient quantity for the cytological examination of epithelial cells found therein for abnormalities. An apparatus is also provided for practicing the method.

3,786,802

LEG UNIT INSERTS

Nubar D. Hagopian, Waltham, and John M. Colman, Lexington, both of Mass., assignors to Medical Innovations, Inc., Waltham, Mass.

Filed Oct. 24, 1972, Ser. No. 299,712
Int. Cl. A61h *1/00*
U.S. Cl. 128—24 R **3 Claims**

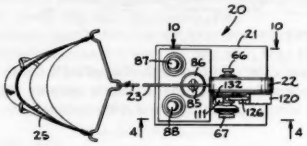


In an external pressure circulatory assist apparatus of the kind wherein hydraulic pressure is cycled against a patient's legs usually in synchronization with the patient's heartbeat, means to improve the performance of the apparatus on smaller patients by providing rigid leg inserts adapted to fit between the upper portion of a supine patient's legs and a rigid shell for enclosing both the inserts and a hydraulic blanket. The inserts provide means to improve pressure cycle control on a patient's legs.

3,786,803
APPARATUS FOR APPLYING THERAPUTIC TRACTION IN PROGRESSIVE INTERMITTENT INCREASE OF MAGNITUDE

Laurence R. Petulla, 2290 Highland Park Ln., Campbell, and Harris E. Fik, 420 Alberto Way, Dept. 19, Los Gatos, both of Calif.

Filed Apr. 28, 1972, Ser. No. 248,637
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 10 Claims

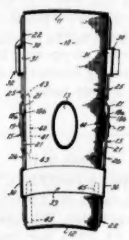


Apparatus for applying therapeutic traction to a patient in which a solenoid energized simultaneously with the energization of an intermittently operated traction motor actuates a ratchet wheel fixed to a device that controls the magnitude of applied traction to increase intermittently and automatically the magnitude of applied traction for each cycle over a preselected period of time until a maximum magnitude of applied traction is reached.

3,786,804
HINGED KNEE BRACE HAVING TORQUE PADS FOR PRODUCING INWARD SUPPORT PRESSURE

Hector E. Lewis, Cincinnati, Ohio, assignor to Surgical Appliance Industries, Inc., Cincinnati, Ohio

Filed Aug. 7, 1972, Ser. No. 278,372
Int. Cl. A61f *5/00*
U.S. Cl. 128—80 C 3 Claims

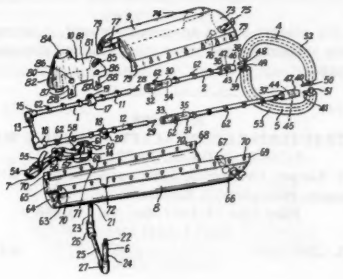


A knee brace for supporting a weakened knee having a single-piece cylindrical sleeve of elastic material dimensioned to accommodate the wearer's knee. A pair of hinges with elongated arms are located on opposite outer sides of the sleeve to laterally support the knee without impairing the normal bending of the knee joint. Pads are provided on both sides of the sleeve between the associated lower arms of each hinge and opposite sides of the knee to provide a torque on the hinge arms which results in the application of an inward supporting pressure on the knee joint. A pair of openings are provided on the front and rear of the sleeve to accommodate the kneecap and to prevent bunching of the sleeve as the knee bends. Additionally, a pair of replaceable strips are provided to alternatively fully encircle or partially encircle the wearer's leg above and below the knee to insure that the brace will remain properly positioned.

3,786,805
SPLINT HAVING INFLATABLE DETACHABLE CUSHIONS

Andre Marcel Tourin, Paris, France, assignor to Institute Europeen de Recherces et d'Applications Medicales "I.E.R.A.M.", Paris, France

Filed Oct. 5, 1971, Ser. No. 186,664
Claims priority, application France, Oct. 6, 1970, 70.36047
Int. Cl. A61f *5/04*
U.S. Cl. 128—87 R 5 Claims

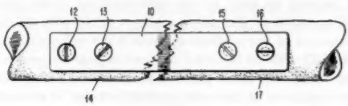


Elongated, inflatable cushions are detachably secured along the length of a U-shaped frame adapted to support the limb of a vertebrae. A stretching device is provided for encircling the ankle of the user to apply tension to the supported limb.

3,786,806
THERMOCONSTRICTIVE SURGICAL APPLIANCE

Alan A. Johnson, S.W. 620 Dawnview, Pullman, Wash., and Frank P. Alicandri, 511 Emerson Ave., Teaneck, N.J.

Continuation-in-part of Ser. No. 72,651, Sept. 16, 1970, abandoned. This application Nov. 22, 1972, Ser. No. 308,739
Int. Cl. A61f *5/04*
U.S. Cl. 128—92 D 7 Claims



The application of a plate of thermoconstrictive material for extra-medullary fixation of fractured bones is described. The plate, consisting of a nickel-titanium alloy, is subjected to deformation by a tensile stress below its critical transition temperature. Upon securing the plate over the fracture, heat is applied at or above the transition temperature thereof so as to return it to its original state, thereby drawing the fractured bone ends together.

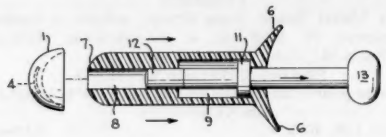
3,786,807
DISPOSABLE DIAPHRAGM AND INSERTION-REMOVAL UNIT THEREFOR

Dale B. Dubin, 25 Park Ln. South, Menands, N.Y.

Filed Feb. 29, 1972, Ser. No. 230,303
Int. Cl. A61f *5/46*
U.S. Cl. 128—127 9 Claims

A disposable diaphragm and reusable insertion-removal unit which enables the user to easily insert, position and remove the diaphragm. The diaphragm includes a magnetically attractable object embedded in absorbent material, such magnetically attractable object being attracted to or released

from the tip of an insertion-removal unit, the insertion-removal unit having a magnet at the end of a plunger-rod.



When the plunger-rod is advanced forward, it attracts and holds the diaphragm and when it is retracted it releases the diaphragm.

3,786,808

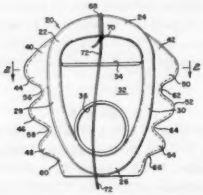
INTRAUTERINE CONTRACEPTIVE DEVICE WITH SCALLOPED EDGE APPENDAGES

Irwin S. Lerner, Greenwich, Conn., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Filed June 23, 1971, Ser. No. 155,866

Int. Cl. A61f *5/46*

U.S. Cl. 128—130 **62 Claims**



An intrauterine contraceptive device made from plastic and having a perimetral ring with or without a central membrane and including perimetral appendages having scalloped side edges located on each of the side portions of the perimetral ring. The width of the outer scallops preferably decreases as the locations of the scallops approach the tail portion, providing the IUD with an inverted somewhat pear shaped scalloped outline when viewed in plan. A marker and extraction string or line is secured at the nose portion but can be secured to the tail portion. The scalloped appendages are constructed in the manner of webs which are substantially flat or they can be hollow with a bulbous cross-section. Internal of the perimetral ring is preferably a membrane which may be a single wall or made hollow by having a double wall. The membrane has openings at least adjacent the nose and the tail. The internal membrane can be centrally disposed or made as internally scalloped appendages.

3,786,809

DEVICE FOR TREATING INFANTS HAVING BREATHING DIFFICULTIES

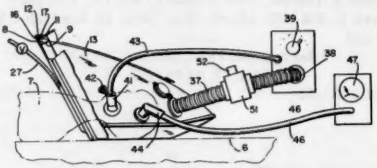
Sotiris Kitrilakis, Berkeley, Calif., assignor to Tecna Corporation, Emeryville, Calif.

Filed Sept. 7, 1972, Ser. No. 286,968

Int. Cl. A61m *16/02*

U.S. Cl. 128—191 **8 Claims**

A device for treating infants having breathing difficulty has a rigid, externally grooved ring to one side of which is attached a clear, flexible, plastic envelope adapted to contain the infant's head and provided with a connection for a flexible hose leading breathing gas under pressure from a suitable source into the envelope. The other side of the ring is spanned by a flexible, plastic diaphragm overlying the groove and held in engagement with the ring by a quickly removable contracting band deforming the diaphragm material into the groove. The diaphragm has an opening therein encircled by a collar ad-



justable into close contact with the infant's neck. The envelope has a slider-closed major access opening and various fittings for minor access and monitoring connections.

3,786,810

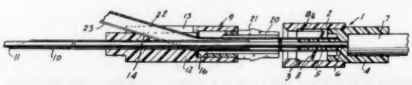
PLACEMENT APPARATUS FOR POSITIONING AN ELONGATED ELEMENT IN A BODY LUMENT

Karl A. Pannier, Jr.; Gordon S. Reynolds, and James L. Sorenson, all of Salt Lake City, Utah, assignors to Levoy's, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 885,803, Dec. 17, 1969, abandoned. This application Mar. 22, 1971, Ser. No. 126,439

Int. Cl. A61m *31/00*

U.S. Cl. 128—214.4 **17 Claims**



A placement apparatus or unit for positioning an elongated element in a body lumen, and a method of using the same. The elongated element may be a catheter, piezoelectric transducer means carried in a catheter, a coaxial cable, or other sensing means, which may or may not have a lumen therethrough, but which may be connected to apparatus for indicating or recording central arterial pulse wave-forms and other heart actions. The element is encased in a sheath to which the proximal end of the element is removably connected, and the element is advanced relatively to a needle into a body lumen by pulling or pushing the sheath through an opening in the needle hub. The method involves monitoring venous or arterial pressure from the point of entry into a body lumen to the thoracic cavity at or adjacent the heart.

3,786,811

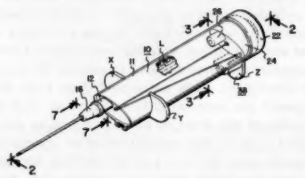
SYRINGE CONSTRUCTION

Le Grand K. Holbrook, Salt Lake City, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Filed Aug. 12, 1971, Ser. No. 171,211

Int. Cl. A61m *5/22*

U.S. Cl. 128—218 P **3 Claims**



The compact syringe construction wherein the internal plunger is externally actuated by a side-mount actuator so

connected to an interior plunger portion that a forward advance of the actuator will effect a forward advance of the interior plunger, this for desired liquid expression from the syringe. Two embodiments of the invention specifically disclose teachable, flexible elongate connector inter-engagement of the plunger and actuator and also a pin-type sealed interconnection. General syringe improvements as to slanted forward-face closure, and related items are included.

3,786,812

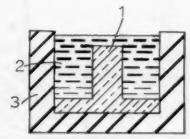
CONTACT LENS FOR OLAR DRUG DELIVERY

Charles W. Neefe, Box 429, Big Spring, Tex.

Continuation-in-part of Ser. No. 45,333, June 11, 1970, which is a continuation-in-part of Ser. No. 562,022, May 16, 1966, abandoned. This application Mar. 10, 1972, Ser. No. 233,408. The portion of the term of this patent subsequent to Sept. 25, 1990, has been disclaimed.

Int. Cl. A61m *7/00*

U.S. Cl. 128—260 **4 Claims**



A method of making a contact lens for delivering medications directly to the ocular tissue. The central segment being transparent and capable of correcting refractive errors. The peripheral segment containing the desired medication and the rate at which the medication is released to the eye is controlled.

3,786,813

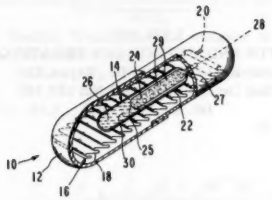
DRUG DELIVERY DEVICE WITH SELF ACTUATED MECHANISM FOR RETAINING DEVICE IN SELECTED AREA

Alan S. Michaels, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 300,673, Oct. 25, 1972, abandoned. This application Dec. 27, 1972, Ser. No. 318,798

Int. Cl. A61m *31/00*

U.S. Cl. 128—260 **8 Claims**



A device is disclosed for administering a drug at a controlled rate for a prolonged period of time to a drug receptor area to produce a nonsystemic or systemic physiological or pharmacological effect. The device is comprised of a hollow deformable member that is movable from a collapsed to an expanded position and returnable to a collapsed position after an extended period of time. A housing is attached to the deformable member and it is internally divided into a first and second chamber with the chambers separated by an impermeable, pressure responsive movable bladder. The first chamber contains a drug and it has a discharge port for releasing the drug to the exterior of the device. The second chamber contains a means for generating pressure that is applied against the bladder. Drug is released from the first chamber through the discharge port by the bladder moving in response to pressure generated in the second chamber to increase its volume while simultaneously reducing the volume of the first chamber to release the drug at a controlled rate over a prolonged period of time. The device is initially optionally contained in a bioerodible container that erodes in the area to release the container.

3,786,814

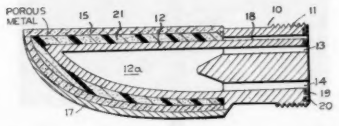
METHOD OF PREVENTING CRYOADHESION OF CRYOSURGICAL INSTRUMENTS AND CRYOSURGICAL INSTRUMENTS

Thomas A. Armao, 1242 56th St., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 213,380, Dec. 29, 1971, abandoned. This application Dec. 15, 1972, Ser. No. 315,314

Int. Cl. A61b *17/36*

U.S. Cl. 128—303.1 **38 Claims**



A method of preventing cryoadhesion of cryosurgical instruments comprises placing on the surface of the instrument which comes in contact with tissue a coating of a fluorocarbon anti-cryoadhesion material which is a good heat conducting material which is liquid at ambient temperatures and remains a liquid at cryogenic temperatures and which is non-toxic to tissue. A cryosurgical instrument which prevents cryoadhesion has a hollow inner portion of a good heat conducting material having a cryogenic fluid inlet passage opening into the hollow interior thereof and a cryogenic outlet passage opening out of the hollow interior thereof. A sheath is provided which is of a good heat conducting material, at least a portion of which is porous. The sheath is positioned around the inner portion and spaced therefrom to define an enclosed space between the sheath and the inner portion. The instrument has an anti-cryoadhesion inlet passage therethrough opening into the enclosed space for anti-cryoadhesion material to flow into the space and through the porous portion of the sheath so that it is always present on the surface of the instrument during its use.

3,786,815

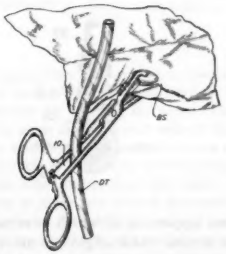
RADIOPAQUE CLAMP

Richard E. Ericson, Keene, N.H., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed July 14, 1971, Ser. No. 168,785

Int. Cl. A61b *17/28, 17/08*

U.S. Cl. 128—321 **5 Claims**



A surgical clamp of the scissors type, adapted to be locked closed and having knurled clamping surfaces which can be

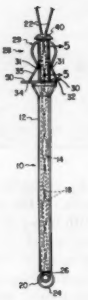
brought into contact, straight edge clamping portions which cannot be brought into contact, and an opening between the pivot point and handles through which a tube can be passed and held while the first named clamping surfaces are engaged with a support such as a bed sheet, the two halves of the clamp being identical and being injection molded of glass-fiber-filled nylon.

3,786,816

METHOD AND APPARATUS FOR OCCLUDING FLUID FLOW THROUGH VESSELS

Sidney Wolvek, Brooklyn, N.Y., assignor to Technibiotics, Inc., Brooklyn, N.Y.

Filed Dec. 21, 1972, Ser. No. 317,233
Int. Cl. A61b *17/12, 17/10*
U.S. Cl. 128—325 **7 Claims**



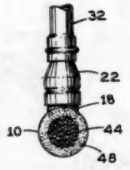
A vascular conduit tourniquet including a sleeve having a bore defined by a wall formed of a resilient material and a spring clip fixed over the sleeve, preferably at the end of the sleeve opposite from the vessel which is to be occluded. Umbilical tape is passed under the vessel, the ends of the tape threaded through the sleeve bore and, while holding the ends of the tape, the sleeve is advanced against the vessel, thereby occluding the blood flow therein. The spring clip is then pinched forcing the sleeve walls together capturing the tape therein and maintaining the sleeve against the vessel in occluding relationship therewith.

3,786,817

METHOD AND APPARATUS FOR AIDING SEVERED NERVES TO JOIN

James R. Palma, 1502 Curry Rd., Schenectady, N.Y.

Continuation-in-part of Ser. No. 193,389, Oct. 28, 1971, abandoned. This application June 1, 1972, Ser. No. 258,737
Int. Cl. A61b *17/04*
U.S. Cl. 128—334 R **11 Claims**



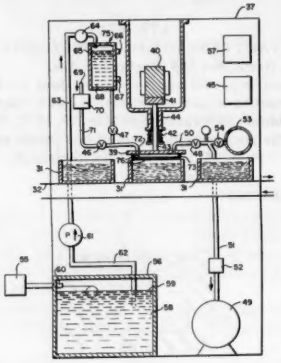
Method and apparatus in which severed nerve ends are placed inside a tube which aligns the nerve ends and guides them to promote joining of the nerve ends. An ambience may be provided inside the tube which further promotes joining of the nerve ends.

3,786,818

APPARATUS FOR TURGOR CONDITIONING TOBACCO

William H. Johnson, Raleigh, N.C., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 14,060, Feb. 24, 1970, Pat. No. 3,710,803. This application Aug. 28, 1972, Ser. No. 284,170
Int. Cl. A24b *03/18*
U.S. Cl. 131—136 **1 Claim**



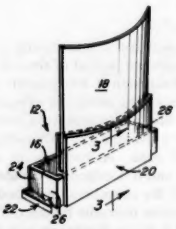
Tobacco is shredded or strip form is turgor conditioned prior to sublimation drying to produce tobacco of high specific volume with minimal alteration of the chemical characteristics and intercellular structure of the tobacco by establishing a high vacuum around the tobacco to remove rapidly air and water vapor from within the cells and intercellular spaces of the tobacco, supplying liquid water to the evacuated tobacco and raising the ambient pressure to drive the water into the cells and intercellular spaces of the tobacco. Apparatus for carrying out the method includes sealable containers for tobacco, means for evacuating the container, means for introducing water into the evacuated containers and means for pressurizing the container to or above atmospheric pressure. The containers are disposed an a conveyor and brought into sealing engagement with a closure member which is connected to the evacuating means and the water and pressure supply. The actuation of the various means in the sealing means is brought about by a sequence timer in the system.

3,786,819

APPARATUS AND METHOD FOR TREATING HAIR

Audrey M. Cantrell, 111 Ehlinger Dr., Bryan, Tex.

Filed Oct. 18, 1971, Ser. No. 189,959
Int. Cl. A45d *1/00*
U.S. Cl. 132—9 **9 Claims**



A spacer for use in treating hair has an integral clamp for sealingly gripping a quantity of hair to be treated, a trough for

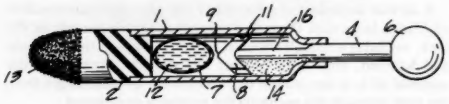
holding the quantity of hair for applying a treat-ment material thereto, and an integral connector for selectively connecting the clamp to the trough. This spacer may be used in a method for treating hair having the steps of sealingly gripping a quantity of hair to be treated with a gripping device, holding the hair to be treated in an open trough, treating the hair in the open trough while permitting excess treating material to move toward the gripping device, and collecting the excess treating material within a cavity associated with the gripping device.

3,786,820

MIXER AND APPLICATOR FOR FINGERNAIL REPAIR MATERIAL

Rudolph J. Kopfer, 137 Almenar Dr., Greenbrae, Calif.

Filed Feb. 20, 1973, Ser. No. 333,874
Int. Cl. A45d *29/18*
U.S. Cl. 132—74.5 **16 Claims**



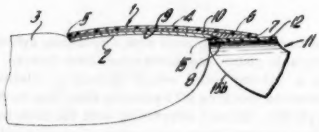
A transparent tube has on one end a conical tip with abrasive coating thereon capable of use for preparing a fingernail for repair, and has a mixer and applicator extended into its other end; inside the tube is a crushable capsule containing a liquid monomer; within the tube is a polymer in powder form; means being provided to crush the capsule thereby to release the monomer; said mixer being manipulatable to mix said liquid and powder to suitable consistency observable through the transparent tube, and said mixer being withdrawable from said tube for use as an applicator to apply the mixture to the damaged fingernail, said monomer and polymer being capable of forming an auto polymer with a hardening time of about one-half to one and one-half minutes.

3,786,821

METHOD AND KIT FOR FORMING AN ARTIFICIAL NAIL

Harold P. Noskin, Wantagh, N.Y., assignor to Customcraft Nails, Inc., Rockville Centre, N.Y.

Filed Feb. 9, 1973, Ser. No. 331,320
Int. Cl. A45d *40/30*
U.S. Cl. 132—88.5 **20 Claims**



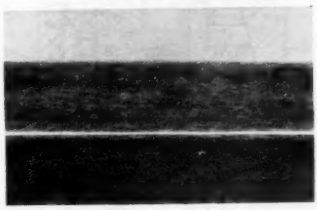
A method and kit for forming an artificial nail whereby a thin plastic cover is bonded to a digit nail and the bonding material is formed so as to taper from the front edge of the digit nail to the front edge of the cover. A method and kit is provided for forming an artificial nail that simulates a natural nail.

3,786,822

ARTIFICIAL HAIR ARTICLES AND PROCESS FOR THE PREPARATION THEREOF

Nobuo Kimura, Yokkaichi, and Yukio Mizutani, Tokuyama, both of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi-ken and Toa Boshoku Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 864,479, Oct. 7, 1969, abandoned. This application Apr. 3, 1972, Ser. No. 240,796
Claims priority, application Japan, Oct. 11, 1968, 43-74414
Int. Cl. A41g *3/00*
U.S. Cl. 132—53 **10 Claims**



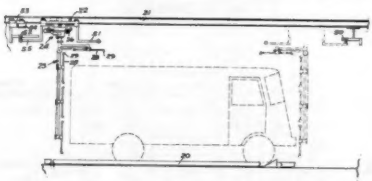
Artificial hair article made of filamentary shaped strands of a fiber-forming, thermoplastic synthetic polymer containing as uniformly dispersed therein and incorporated therewith, particles of cross-linked copolymer of 0.01 to 2 microns in size which do not decompose at the melting point of the fiber-forming, thermoplastic synthetic polymer, in an amount of 0.1 to 10 percent by weight, the strands having a uniformly distributed fine slit-like grooved pattern along their entire length.

3,786,823

TRUCK WASH APPARATUS

Robert B. Wiley, 21630 Knudsen Dr., Grosse Ile, Mich.

Filed July 19, 1971, Ser. No. 163,892
Int. Cl. B60s *3/04*
U.S. Cl. 134—45 **11 Claims**

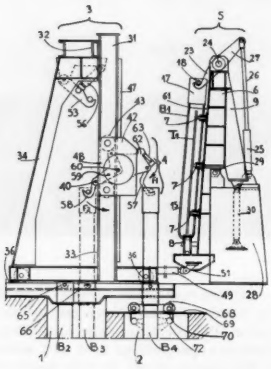


A truck wash apparatus comprising a carriage which is movable back and forth over a stationary truck. The carriage supports spray nozzles for washing the truck. The spray nozzles are movable to wash the sides and ends of the truck. One of the spray nozzle arms extends vertically and is supported by a trolley that is movable transversely of the carriage and is indexable to wash the sides and ends of the truck. The carriage is first moved along to wash one side of the truck, the nozzle arm is then indexed and the trolley is moved transversely to wash an end of the truck, the nozzle is then indexed and the carriage is moved to wash the other side of the truck, and the nozzle is then indexed and the trolley moved to wash the other end of the truck.

3,786,824
CHEMICAL DESCALING APPARATUS FOR DISCONTINUOUS AUTOMATIC TREATMENT OF SHEET METAL

Bernard Lhenry, Le Creusot, France, assignor to Creusot-Loire, Paris, France

Filed July 10, 1972, Ser. No. 270,061
Int. Cl. B08b *3/02*
U.S. Cl. 134—62 **10 Claims**

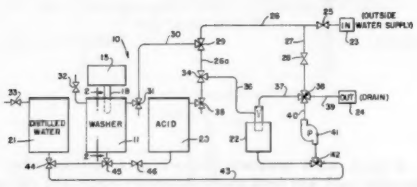


Chemical descaling apparatus is provided for the automatic treatment of sheets of metal, including, a descaling pit and a rinsing pit, with introduction of the sheets into the descaling pit and for transferring them to the rinsing pit. The sheets are handled in a series of cradles by a transfer crane which is horizontally movable between the pits, and which has a vertically movable support bar which includes hooks for supporting the cradles. A runway is used for initially introducing sheets into the cradles.

3,786,825
ACID BATH WASHER APPARATUS

Hassel L. Weisner, P.O. Box 266, Mary Esther, Fla.

Continuation-in-part of Ser. No. 96,878, Dec. 10, 1970, abandoned. This application Aug. 28, 1972, Ser. No. 283,958
Int. Cl. B08b *3/08*
U.S. Cl. 134—99 **5 Claims**

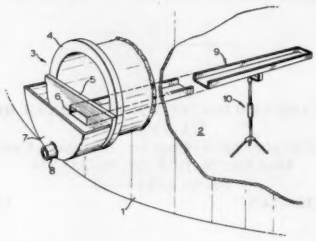


Acid from a storage tank is delivered into a washer tank containing work to be treated. After treatment, the acid is returned to the storage tank and the washer tank is rinsed with water from an outside supply. Distilled water from a distilled water supply tank is then admitted into the washer tank to treat the work therein, and after the distilled water is discharged, a hot air generator delivers hot air into the washer tank to dry the work.

3,786,826
OIL TANK SKIMMING DEVICE

Charles T. Taylor, Port Credit, Ontario, Canada, assignor to Gulf Oil Canada Limited, Toronto, Ontario, Canada

Filed June 12, 1972, Ser. No. 261,836
Int. Cl. B08b *3/00*
U.S. Cl. 134—104 **4 Claims**

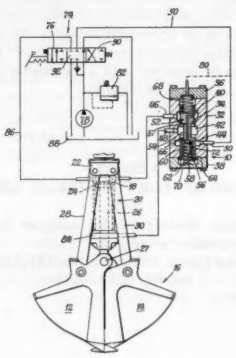


A device to expedite removal of residual water-immiscible oil from a large tank through a manhole entry in the side of the tank, includes a trough which is inserted through the manhole and levelled, after which water fed into the tank floats the residual oil into the trough from which the oil discharges from the tank through the manhole for recovery or disposal.

3,786,827
FLOW CONTROL VALVE

Lawrance F. Berg, Lockport, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 16, 1973, Ser. No. 342,060
Int. Cl. F16k *11/07*
U.S. Cl. 137—109 **11 Claims**



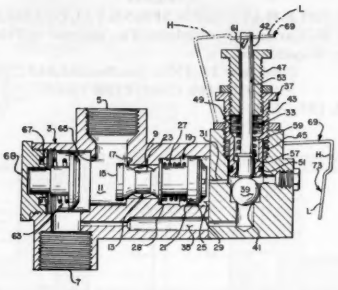
A flow control valve is used with a hydraulic cylinder having a reciprocable piston and a rod connected thereto. The valve includes a valving spool which defines a relatively stable center position blocking off hydraulic fluid flow to the rod end of the cylinder, but not interfering with the flow to the head end of the cylinder. Upon application of pressurized hydraulic fluid to the valve through a line connected to the valve, the valving spool shifts in one direction to allow fluid flow to the rod end of the cylinder, retracting the rod. Upon application of fluid pressure to the head end of the cylinder, the valving spool shifts in the other direction to allow open communication between the rod end and the head end of the cylinder, so that fluid flows from the rod end to the head end of the cylinder, resulting in a super-charged condition at the head end of the cylinder and consequent rapid extension of the rod.

3,786,828

COMPRESSOR UNLOADER AND CHECK VALVE UNIT

Joseph L. Krechel, 1420 Hanley Industrial Ct., Chesterfield, Mo.

Filed Aug. 28, 1972, Ser. No. 284,101
Int. Cl. G05d *16/10*
U.S. Cl. 137—116 8 Claims



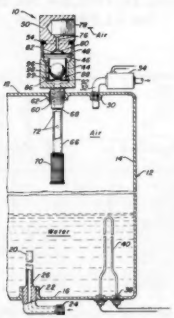
An improved compressor unloader and check valve unit normally operable automatically to unload a compressor when the pressure downstream from the compressor exceeds a predetermined value and having means for locking it in either its loaded or unloaded mode of operation.

3,786,829

VENT VALVE ASSEMBLY

Thomas P. Nardo, Old Bethpage, and Ralph R. Pecoraro, East Northport, both of N.Y., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed June 22, 1972, Ser. No. 265,414
Int. Cl. F16k *45/02*
U.S. Cl. 137—202 2 Claims



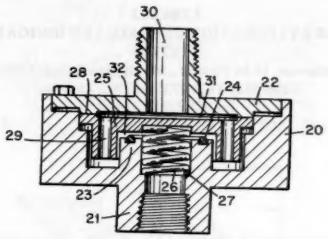
Vent valve assembly for hot water boiler of type used in aircraft galleys permits trapped air in the boiler to escape during the initial fill. The valve includes a floating ball which rises as the boiler is filled so as to seat against an o-ring for sealing the boiler under pressure. A flow diverting plate positioned under the ball permits escaping air to rise rapidly around the ball without causing the ball to lift and be prematurely sealed against the o-ring. The plate also prevents the ball from blocking the air which must enter the boiler when it is drained.

3,786,830

OIL DRAINING VALVE FOR A COMPRESSED AIR CONTAINER

Akihito Owada, Kawaguchi, Japan, assignor to Nippon Piston Ring Kabushiki Kaisha, Tokyo, Japan

Filed July 3, 1972, Ser. No. 268,548
Claims priority, application Japan, Aug. 4, 1971, 46-58328
Int. Cl. F16t *1/14*
U.S. Cl. 137—204 8 Claims



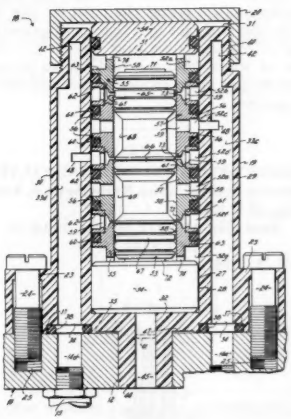
An automatic draining valve having a plate-shaped valve member spring-biased toward a position in which it defines throttling passages connecting the inlet and discharge nipples of the valve. An increased fluid pressure at the inlet nipple causes the valve member to be pressed against a seat on the discharge nipple. The valve permits a container intermittently receiving compressed air to be drained of lubricating oil while at approximately ambient pressure, while sealing the container if it receives compressed air.

3,786,831

VALVE WITH MODULAR MANIFOLD BODY

Wm. L. Clippard, III, Cincinnati, Ohio, assignor to Clippard Instrument Laboratory, Inc., Cincinnati, Ohio

Division of Ser. No. 206,636, Dec. 10, 1971. This application Apr. 5, 1973, Ser. No. 348,303
Int. Cl. F16k *11/00*; F15c *1/06*
U.S. Cl. 137—269 16 Claims



A valve having a modular, multi-passage manifold or body. Different types of valve mechanisms are insertable axially through an open end of a cavity formed within the manifold and are sealed therein by a closure. Fluid connections for the valve mechanism are provided by a plurality of passages which extend parallel to the cavity but within the wall of the

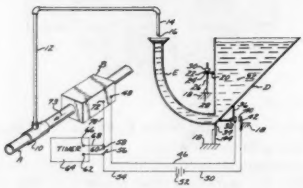
manifold, from a common end of the manifold. Each passage extends longitudinally in the manifold parallel to the cavity over substantially all of the effective length of the cavity, and is selectively ported to the cavity at one or more positions along its length to serve the particular valve mechanism with which the manifold is used. The valve mechanism has circumferential grooves with which the respective manifold cavity ports communicate.

3,786,832

SOLAR EVAPORATION CONTROLLED IRRIGATION SYSTEM

Dale F. Marean, 1626 First St., Manhattan Beach, Calif.

Filed May 18, 1972, Ser. No. 254,746
Int. Cl. E02b *13/00*
U.S. Cl. 137—403 **4 Claims**



A water supply line in a land irrigation system has a normally closed valve included as a part thereof, with the valve when in an open position permitting water to discharge through a pilot line as well as the supply line. A pivotally and eccentrically supported evaporator pan is provided that may receive both rain and water from the pilot line. Adjustable resilient means at all times urge the pan to a first position. Control means to operatively associate the pan and valve that the valve is in an open position when the pan is in a first position.

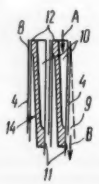
However, when the pan is filled with water, either from the pilot line or by rain, to the extent that the weight of water pivots the pan to a second position, the valve is closed to terminate the irrigation operation. When solar evaporation of water from the pan has depleted the weight of the water to the extent that the resilient means can pivot the pan to the first position, the valve is opened to initiate an irrigation operation. The rate of solar evaporation from the pan and the rate of evaporation of water from the land are so related to one another that the pan pivots to the first position when the land requires irrigation.

3,786,833

DIRECT-FLOW CYLINDRICAL VALVE

Mark Isaakovich Frenkel, ulitsa Karbysheva, 6, korpus 2, kv. 20, Leningrad, U.S.S.R.

Filed Mar. 31, 1972, Ser. No. 240,079
Int. Cl. F16k *15/16*
U.S. Cl. 137—512.15 **4 Claims**



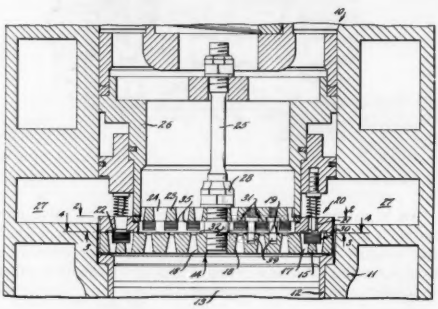
Direct-flow cylindrical valve comprising a pack of serially assembled elements, wherein each element includes adjoining ring-shaped members, for example a seat and a flexible plate. Provided on end faces of the seats are inlet passages for a working medium, in the form of radial slots open at the sides of one of the cylindrical surfaces of the seats, in such a manner that the medium washes the surfaces of the plates along the entire lengths of the slots. The seats also have radial outlet slots, a zigzag slot being formed in the valve, which allows the medium to flow from the inlet slots to the outlet slots.

3,786,834

MULTIPLE WAVE FORM SPRING VALVE ASSEMBLY

Milton W. Garland, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

Filed June 21, 1972, Ser. No. 265,043
Int. Cl. F16k *15/08*; **F16K** *15/12*
U.S. Cl. 137—540 **1 Claim**



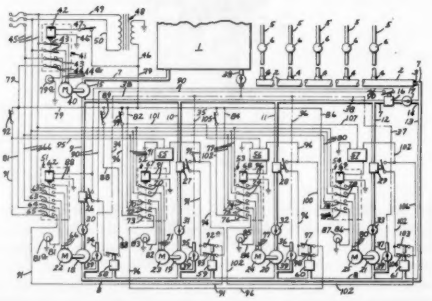
Apparatus for modulating the rate of opening of the valve member in a valve assembly which includes a plurality of wave form springs for each valve member and a flat rigid spacer between each pair of wave form springs.

3,786,835

PUMP CONTROL SYSTEM

John F. Finger, Beresford, S. Dak., assignor to Sioux Steam Cleaner Corporation, Beresford, S. Dak.

Filed Aug. 28, 1972, Ser. No. 284,364
Int. Cl. F04b *41/06*
U.S. Cl. 137—566 **2 Claims**



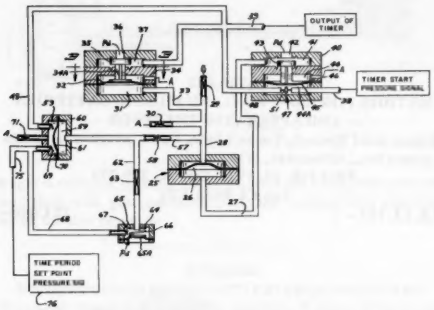
A fluid supply apparatus and control system, the apparatus including a plurality of independently operated fluid outlets and a plurality of fluid pumps each operative upon demand at the outlets to maintain a supply of liquid at least equal to the demand at the outlets. The control system includes control circuitry, fluid pressure operated switches, and relays for energizing only as many pumps as are required to maintain a given pressure under varying volume delivery requirements.

3,786,836

PNEUMATIC TIMER

Lowell A. Kleven, Bloomington, Minn., assignor to Uniflo Systems Company, Edina, Minn.

Filed June 2, 1972, Ser. No. 259,169
Int. Cl. F16k *31/365*
U.S. Cl. 137—624.2 14 Claims



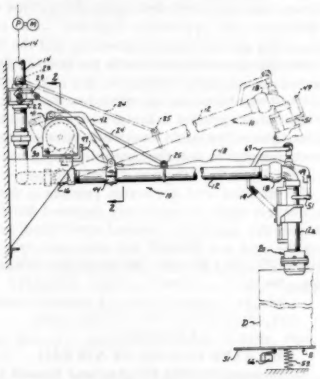
A pneumatic timer which provides a pneumatic signal for a preselected length of time for use in operation of pneumatic systems and which includes means for varying the timer period of the timer in response to an external signal.

3,786,837

FILLING APPARATUS

David D. Pipkins, Downers Grove, Ill., assignor to The Valspar Corporation, Rockford, Ill.

Division of Ser. No. 4,863, Jan. 22, 1970, abandoned. This application Nov. 26, 1971, Ser. No. 202,684
Int. Cl. F16k *5/10, 23/00*
U.S. Cl. 137—625.32 3 Claims



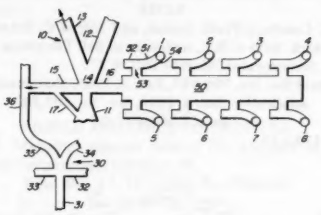
An outwardly extending discharge line is pivotally connected to a supply line. A torsion spring unit urges the discharge line from a lower dispensing position to a raised position. Apparatus is provided for automatically opening and closing a valve in the supply line in response to movement of the discharge line between its positions. An outlet valve is provided at the outlet of the discharge line and is opened and closed by a pneumatic cylinder controlled by movement of a scale. The outlet valve is a ball-type valve having a valve insert with openings of a size such that surface tension of the fluent material will prevent dripping. The insert is formed of a bearing material and is adjustable against the ball valve element to accommodate any wear.

3,786,838

FLUID MULTI-AND LOGICAL CIRCUIT

Elmer L. Swartz, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 22, 1973, Ser. No. 362,720
Int. Cl. F15c *1/14*
U.S. Cl. 137—814 3 Claims



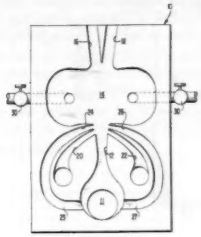
Disclosed herein in a MULTI-AND fluid logic circuit comprising essentially of a conventional fluid amplifier having a power source, first and second control channels and first and second output channels. The amplifier is provided with biasing means which is associated with one of the control channels and means are associated with the other control channel for producing a control signal which is a function of a predetermined number of external signals. More particularly, this last named means comprises a plurality of aspirators, each having an input nozzle and an exhaust nozzle and each connected to an enclosed manifold which in turn is in fluid communication with the second control channel of the fluid amplifier. The operation is such that the simultaneous presence of a fluid signal in all aspirators creates a sufficient pressure change to switch the fluid stream in the fluid amplifier from the first output channel to the second output channel.

3,786,839

HIGH INPUT IMPEDANCE FLUERIC AMPLIFIER

Francis M. Manion, Rockville, and Joseph M. Kirshner, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 800,650, Feb. 19, 1969, abandoned. This application Mar. 15, 1971, Ser. No. 124,610
Int. Cl. F15c *1/04*
U.S. Cl. 137—837 4 Claims



The amplifier includes a supply jet providing fluid to an interaction chamber and a pair of fluid outlet passages on the side of the chamber opposite the supply jet. A pair of control nozzles are provided on laterally opposite sides of the supply jet for deflecting the jet into one or the other of the outlet passages. A pair of supplementary nozzles in communication with the fluid supply are also located on opposite sides of the supply jet. The flow resistance through the supplementary

nozzles is large so that as the jet is deflected by flow through the control nozzle, the supplementary flow increases due to decreased resistance and increases its support of the pressure field deflection. Accordingly, the control flow has a high input impedance requiring little control flow.

3,786,840

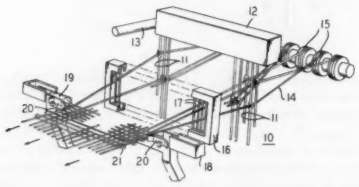
FIBER OPTIC DEVICES AND METHOD FOR MAKING SAME

Jeofry S. Courtney-Pratt, Locust, and Alfred C. Schmidt, Jr., Brunswick, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 796,027, Feb. 3, 1969, abandoned. This application Jan. 4, 1971, Ser. No. 103,581

Int. Cl. D03d *41/00*

U.S. Cl. 139—11 **2 Claims**



This disclosure describes optical fiber devices with machine-reproducible end array transformations. Image interleaving devices with specific end array transformations are described which find use in optical scramblers and color imaging. Modified multiple ply weaving techniques are used to realize the devices.

3,786,841

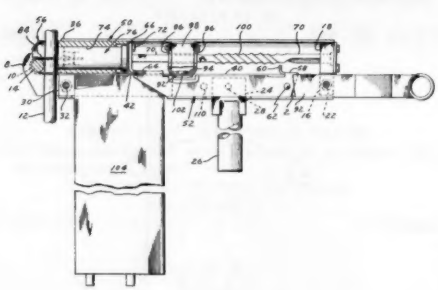
WIRE-TIE FORMING AND TWISTING TOOL

Clifford C. Albrecht, Leicester, and Howard G. Brown, Worcester, both of Mass., assignors to Novelty Tool Company, Inc., Spencer, Mass.

Filed Oct. 13, 1972, Ser. No. 297,360

Int. Cl. B21f *15/04*

U.S. Cl. 140—119 **8 Claims**



A tool for applying, forming, and twisting a wire-tie at rod cross-over points of concrete reinforcement grids and the like, having releasable jaw clamping means to grip intersecting rods together at right angles, wire feeding means to direct the legs of a pre-formed hair-pin like looped wire onto anvil surfaces in said clamping jaws and engage the looped end thereof against one of the rods while said legs are being reversely turned around the other rod with the free ends thereof straddling said first rod, and means for twisting said free ends together. The wire-tie so fastened is characterized by opposed pairs of spaced loops embracing the rods, the loops of the pair about each rod lying in a parallel planar relation to each other and in perpendicular planar relation to the plane of each loop about the other rod. The tool, by sequentially operating actuator means, clamps the jaws, feeds and forms the legs of the preformed wire, twists the free ends, and then releases the jaws in a single reciprocating stroke.

3,786,842

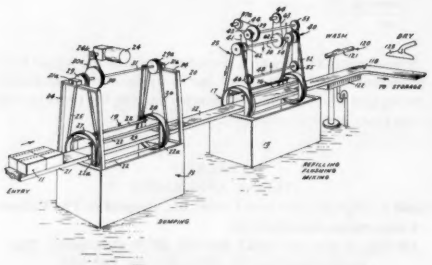
METHOD FOR EMPTYING AND FILLING BATTERIES AND APPARATUS THEREFOR

Helmut Kurt Rinnert, Yorba Linda, Calif., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Feb. 25, 1972, Ser. No. 229,275

Int. Cl. B65b *3/04*

U.S. Cl. 141—1 **22 Claims**



A method and apparatus for simultaneously filling and emptying acid from batteries of the lead acid storage type wherein rows of batteries are oppositely disposed with one row directed upwardly and another downwardly and the batteries immersed into the electrolyte acid with the ports of the batteries positioned substantially normal to the acid liquid level. While immersed, the batteries are rotated so that they assume a position somewhat opposite to that initially and the batteries are then raised above the liquid level while tilted approximately 45° from horizontal so that the upwardly disposed batteries will allow acid to flow from them to achieve proper acid filling volumes. The method and apparatus permits a double fill operation wherein rows of oppositely disposed batteries are immersed with the upwardly disposed rows filled with acid, raised from the acid and drained and subsequently immersed and filled to the desired level by the previously indicated tilting procedure.

3,786,843

DELAYED FILLING OF AIR BAG

Robert L. Stephenson, Sterling Heights, and Donald J. Lewis, Troy, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.

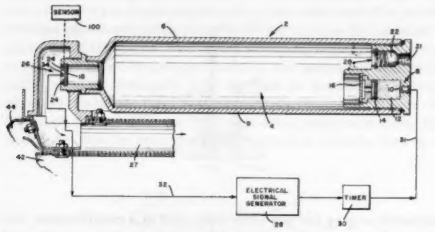
Continuation-in-part of Ser. No. 81,947, Oct. 19, 1970, Pat. No. 3,674,059. This application Aug. 24, 1971, Ser. No. 174,444

Int. Cl. B60r *21/08;* **B65d** *35/26;* **B65b** *31/04*

U.S. Cl. 141—13 **2 Claims**

A method and apparatus for filling motor vehicle gas bags. A gas-filled cylinder is provided with an inlet pressure sensitive rupture disc and a dislodgeable outlet plug. The inlet disc is in communication with a combustible material. The material is fired, yielding a gaseous product. The outlet plug is dislodged before the rupture of the inlet disc at least substantially emptying the cylinder before said disc ruptures. The

liberated gas flows to a diffuser, about which a motor vehicle gas bag or bags are disposed, whereby the filling of gas bag (or



bags) is delayed, it being filled first with gas filling the cylinder and then with gas generated from the combustible material when the disc ruptures.

3,786,844

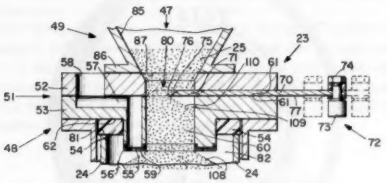
FILLING CONTAINERS WITH FRIABLE PARTICLES

Wayne W. Smearsoll, Loveland, and John F. Kaar, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 12, 1971, Ser. No. 171,049

Int. Cl. B65b *1/20, 1/32, 3/28, 31/02, 37/18, 59/02;* **B02c** *19/12, 25/00*

U.S. Cl. 141—8 **11 Claims**



A method of filling a succession of containers with friable particles so that the average weight of volumetrically filled containers is substantially uniform, the method comprising controlling the cross-sectional area of an aperture through which the particles flow from a hopper into the container, the area of the aperture being adjusted in response to the deviation from normal of the average filled weight of a preceding plurality of containers.

3,786,845

PNEUMATIC SCREWDRIVER OR LIKE ROTARY TOOL

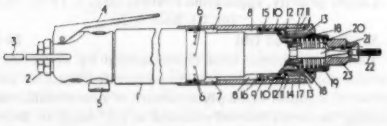
Ronald Frederick States, Hendon, England, assignor to Desoutter Brothers Limited, London, England

Filed Oct. 13, 1972, Ser. No. 297,369

Claims priority, application Great Britain, Nov. 5, 1971, 51578/71

Int. Cl. B25b *23/08*

U.S. Cl. 144—32 **6 Claims**



A pneumatic screwdriver having a hollow fastener finder around a rotary bit, in which finder a sub-atmospheric pressure of air is provided to pick up and hold a fastener in the finder by the passage of sir through an annular passage way adjacent the head of the tool formed by a stepped sleeve in a bore in the casing, the air first passing through the narrow part of the passage way before emerging into the wider part of the passage way, and having radial bores opening into the wider part of the passage way adjacent the step in the sleeve to induce flow of air radially outwards through the bores and thereby induce a sub-atmospheric pressure in the hollow of the fastener.

3,786,846

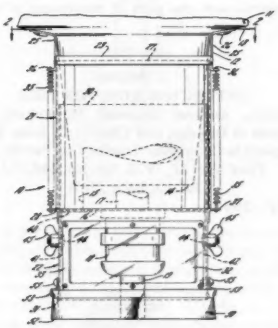
SHIELD ASSEMBLY FOR ROUTER

Lucien L. Mehring, Morton Grove, Ill., assignor to Danley Machine Corporation, Chicago, Ill.

Filed Oct. 17, 1972, Ser. No. 298,414

Int. Cl. B27g *21/00*

U.S. Cl. 144—251 **7 Claims**



A shield assembly for a router which is made up of two relatively telescoping sections, with the upper section being secured to the headstock and the lower section being coupled to the spindle carrier so that it moves with the tool. To couple the lower section to the spindle carrier a ledge member is adjustably secured between them. The sections are biased together with interposed stops so that the lower section occupies a reference position but is engaged by the spindle carrier when the latter moves downwardly toward the work. The lower section is provided with a window of transparent material for viewing the field of operation of the tool. The lower section is also provided with an encircling brush which yields as the tool is fed axially into engagement with the work. Finally, the lower section has provision for evacuation with ambient air being drawn through the bristles of the brush for continuous clearing away of chips.

3,786,847

SAFETY SLEDGE-HAMMER

Enos L. Schera, Jr., 8254 S.W. 37 St., Miami, Fla.

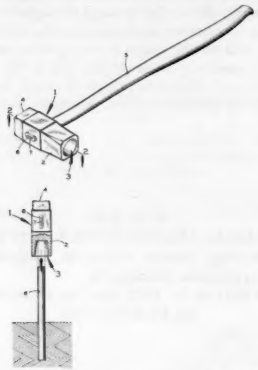
Filed Nov. 6, 1972, Ser. No. 304,048

Int. Cl. B25c *1/00*

U.S. Cl. 145—29 R **5 Claims**

This invention is a hammer adapted for the safe driving of long rods into the earth. Building codes require long rods drive into the ground for temporary and permanent ground connections for electric systems, or rods or pipe for marking surveyed locations. This hammer is provided with a cavity in one impact

end in order to avoid outside misses dangerous to the person temporarily holding the rod. The cavity has conical walls for



guiding the end of the rod or pipe which often vibrates out of exact alignment with the path of movement of the hammer head.

3,786,848

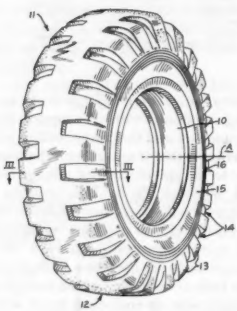
DEFLECTOR RING FOR TIRE

Wayne Brown, Aurora; Raymond W. Fabere; Gerald E. Grant, both of Oswego, and Charles C. Sons, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 24, 1972, Ser. No. 246,714

Int. Cl. B60c *11/04*

U.S. Cl. 152—209 R **10 Claims**



A tire has an annular tread forming a plurality of circumferentially spaced tread bars thereon. A circumferentially continuous deflection ring is formed at the juncture of the tread with each tire sidewall to project beyond such sidewall to provide full protection thereat during tire operation.

3,786,849

TYRE STUD

Kaj-Ragnar Loqvist, Fagersta, Sweden, assignor to Fagersta Aktiebolag, Fagersta, Sweden

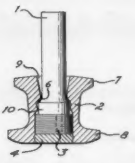
Filed Apr. 5, 1972, Ser. No. 241,341

Claims priority, application Sweden, Apr. 20, 1971, 5084/71

Int. Cl. B60c *11/16*

U.S. Cl. 152—210 **8 Claims**

There is disclosed herein a tyre stud structure comprising a body portion for insertion in a vehicle tyre and a stud pin mounted in the body for limited axial movement in the radial direction with respect to the tyre. Means are provided for



resiliently urging the pin outwardly, and in a modification, the outwardly projecting portion of the pin has a sleeve positioned thereover.

3,786,850

BALANCED TIRE

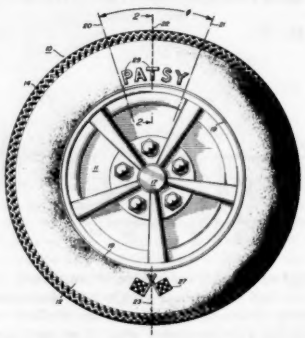
Alexander Turoczi, Jr., R.D. 01, Box 133, Bath, Pa.

Division of Ser. No. 97,938, Dec. 12, 1970, Pat. No. 3,663,328.

This application Jan. 13, 1972, Ser. No. 217,686

Int. Cl. B60b *13/00*

U.S. Cl. 152—330 **3 Claims**



A tire, balanced with respect to the wheel upon which it is mounted, utilizes a plurality of weights. These weights are in the form of indicia mounted upon the side walls of the tire, rather than upon the wheel, and are arcuately distributed to achieve both the required balance and a predetermined, highly visible, identifying and/or decorative effect which makes the tire readily recognizable and easily identifiable. An improved method of balancing a tire in accordance with the invention is also disclosed.

3,786,851

BELTED PNEUMATIC TIRES

Henri Mirtain, and Jacques Vervin, both of Compiegne, France, assignors to Uniroyal S. A., Neuilly-Sur-Seine, France

Filed Mar. 2, 1971, Ser. No. 120,090

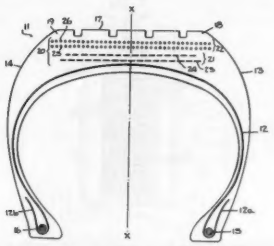
Claims priority, application France, Mar. 4, 1970, 70.07797

Int. Cl. B60c *9/20*

U.S. Cl. 152—361 DM **26 Claims**

Belted pneumatic tires characterized by improved tread-reinforcing breaker constructions are disclosed. In any such breaker, a plural-layer ply structure of non-metallic cord ply having the cords thereof oriented at a 0° angle to the median equatorial plane of the tire is superposed on a plural-layer ply structure of metallic wires or strips which in each layer are crossed relative to those in the adjacent layer and are oriented

at a bias angle, preferably between 16° and 30°, to the plane. The layers of non-metallic cord ply structure are of equal width and are symmetrical with respect to the median equatorial plane. The plural-layer non-metallic cord ply structure is constituted by a single length of breaker cord wound in a continuous spiral circumferentially of the carcass for at least a plurality of full turns. The layers of the metallic ply structure may be of equal or unequal widths, and arranged symmetrically or asymmetrically with respect to median equatorial plane of the plural-layer nonmetallic ply structure. Where the layers of the metallic ply structure have unequal widths, the widest ply may be either radially outward or radially inward of



the other ply or plies. The width of the non-metallic ply structure ranges from 30mm more to 30mm less than the width of the widest ply layer of the metallic ply structure. The widest ply layer of the metallic ply structure is symmetrical with respect to the median equatorial plane and the non-metallic ply structure.

The foregoing abstract is not to be taken either as a complete description or as a limitation of the present invention. In order to understand the full nature and extent of the technical disclosure of this application, reference must be had to the following detailed description and the accompanying drawings as well as to the claims.

3,786,852

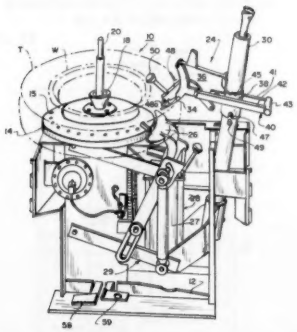
TIRE CHANGER APPARATUS

Robert W. Houston, Cincinnati, Ohio, assignor to Applied Power Industries, Inc., Milwaukee, Wis.

Filed Apr. 22, 1971, Ser. No. 136,343

Int. Cl. B60c *25/06*

U.S. Cl. 157—1.1 **12 Claims**



A tire changer including a seat expander for sealing beads of a tubeless tire onto a wheel. The wheel and unmounted tire are supported on a support table having a series of holes communicating with manifold chamber constructed in a segment of the support table. The chamber is selectively coupled to a source of high pressure air to cause the air to be directed into the peripheral cavity of the wheel around the outer rim for deflection into the tire cavity. The air pressure induced in the tire cavity causes flexing of the side walls of the tire to seat the beads thereof in the seating area of the wheel. The application of pressure into the tire is controlled by a foot pedal which is operatively connected to a valve imposed between the air source and the manifold chamber.

3,786,853

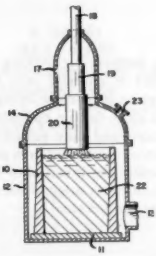
PRODUCTION OF LARGE STEEL INGOTS USING AN ELECTRODE REMELTING HOT TOP PRACTICE

Lloyd R. Cooper, Pittsburgh, Pa., assignor to Heppenstall Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 144,440, May 18, 1971, Pat. No. 3,696,859, which is a continuation-in-part of Ser. No. 80,669, Oct. 14, 1970, abandoned. This application June 7, 1972, Ser. No. 260,410. The portion of the term of this patent subsequent to Oct. 10, 1989, has been disclaimed.

Int. Cl. B22d *27/02*

U.S. Cl. 164—52 **10 Claims**



A method is provided for preventing shrinkage cavities and voids in steel ingots by the steps of forming a body of degassed molten steel in an ingot mold and continuously supplying molten steel by remelting an electrode into the body of molten steel at a controlled rate substantially equal to the volume loss by shrinkage on cooling until the body of steel is solidified.

3,786,854

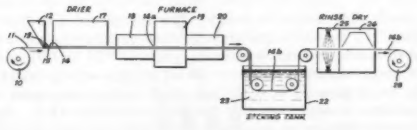
METHOD OF MAKING BRAZING ALLOY

Howard Mizuhara, San Mateo, and Nicholas T. Gamer, Palo Alto, both of Calif., assignors to Western Gold & Platinum Company, Belmont, Calif.

Filed Mar. 1, 1972, Ser. No. 230,794

Int. Cl. B22d *11/06*

U.S. Cl. 164—80 **3 Claims**



A method of making a substantially pure brittle brazing alloy in solid form such as sheet or strip consists of forming a paste with an atomized or mechanically powdered alloy and an organic vehicle, continuously applying the paste at a uniform predetermined thickness to a metallic substrate, thermally expelling the organic vehicle from the alloy layer, melting the alloy granules without melting the substrate, and chemically or otherwise removing the substrate. The method preferably is practiced with a continuously moving line which begins with a supply roll of the substrate and ends with a roll of the pure brazing alloy in strip form. This alloy strip may thereafter be blanked or otherwise formed into desired shapes for use as brazing inserts.

3,786,855

ROTARY CASTING METHOD OF KILLED STEEL

Kimio Saito, and Yutaka Fujisawa, both of c/o Itoh Iron & Steel Works Co., Ltd., No. 4-1, 5-chome, Matsue, Edogawa-ku, Tokyo, Japan

Filed May 25, 1971, Ser. No. 146,674
Int. Cl. B22d *27/04, 27/08*
U.S. Cl. 164—126 5 Claims

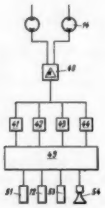
A rotary casting method for making a killed steel ingot wherein molten steel is charged into the ingot mold, the charged molten steel on its surface being sprayed with water or compressed cold air to form a coagulation layer, and after passage of a predetermined time period the ingot mold containing the molten steel is inverted or is positioned in horizontal direction, whereafter the inverted or horizontally directed ingot mold is returned to its original vertical upright position for coagulation of the molten steel.

3,786,856

METHOD FOR CONTROLLING A CONTINUOUS CASTING INSTALLATION IN THE EVENT OF MOLTEN METAL BREAKOUT

Tomio Nishikawa, Takatsuki, Japan, assignor to Concast AG, Zurich, Switzerland

Filed Feb. 4, 1972, Ser. No. 223,674
Claims priority, application Japan, Feb. 22, 1971, 46-8843
Int. Cl. B22d *11/12*
U.S. Cl. 164—4 7 Claims



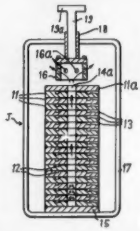
A method for controlling a continuous casting installation in the event of molten metal breakout wherein during the casting operation the light intensity at the secondary cooling zone of the continuously cast strand is monitored, changes in the light intensity with predetermined threshold values are compared and upon exceeding any such predetermined threshold values electrical signals are produced by means of which it is possible to control the continuous casting operation.

3,786,857

METAL CASTING APPARATUS WITH MECHANISM FOR IMMERSING JIG AND MOULD

Alan Sutherland, Bradford, England, assignor to Hepworth and Grandage Limited, Bradford, England

Continuation-in-part of Ser. No. 762,201, Sept. 16, 1968, abandoned. This application May 7, 1971, Ser. No. 141,114
Claims priority, application Great Britain, May 14, 1970, 23508/70
Int. Cl. B22d *23/00*
U.S. Cl. 164—350 8 Claims



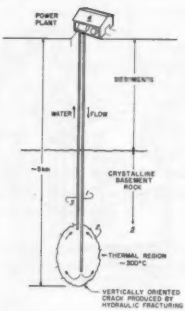
This invention relates to a process for casting articles from molten metal by the immersion of a mould or stack of moulds carried in a jig into a melt of the metal to be cast such that the cavity or cavities in the or each mould become filled with molten metal as the jig is immersed in the melt, whereafter the jig carrying the mould or stack of moulds is removed from the melt. Each mould cavity has a permanently open ingate and at least some of the heated air or gas within the cavity escapes through the ingate as the ingate passes through the surface of the melt, thereby preventing the entry of impurities from the surface of the melt into the cavity.

3,786,858

METHOD OF EXTRACTING HEAT FROM DRY GEOTHERMAL RESERVOIRS

Robert M. Potter; Eugene S. Robinson, and Morton C. Smith, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

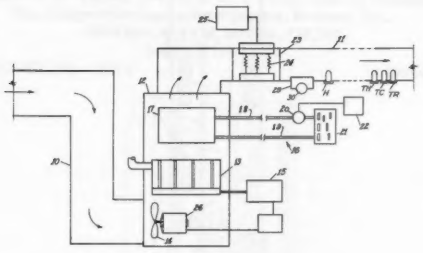
Filed Mar. 27, 1972, Ser. No. 238,435
Int. Cl. F28d *21/00*
U.S. Cl. 165—1 5 Claims



Hydraulic fracturing is used to interconnect two or more holes which penetrate a previously dry geothermal reservoir, and to produce within the reservoir a sufficiently large heat-transfer surface so that heat can be extracted from the reservoir at a usefully high rate by a fluid entering it through one hole and leaving it through another. Introduction of a fluid

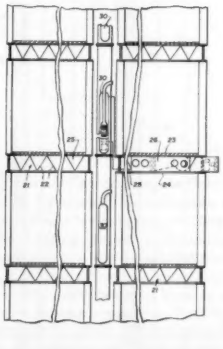
into the reservoir to remove heat from it and establishment of natural (unpumped) convective circulation through the reservoir to accomplish continuous heat removal are important and novel features of the method.

3,786,859
TEMPERATURE AND HUMIDITY CONTROL AND APPARATUS FOR RESIDENTIAL BUILDINGS
Wendell E. Day, Box 338, Sunbury, Ohio
Filed June 19, 1972, Ser. No. 263,779
Int. Cl. F24f *3/14*
U.S. Cl. 165—21 **5 Claims**



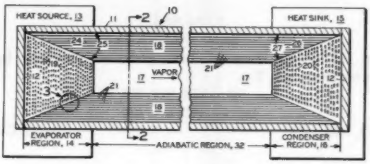
Apparatus and electrical control circuit is provided for control of temperature and humidity in residential structures. Heating and cooling of residences utilizes separate units for heating and cooling that are independently operable although both units are incorporated in a common air circulation system. A change-over type control system is provided to permit essentially seasonal operation as to either heating or cooling. The apparatus and electrical control circuit provided includes a humidity sensor and auxiliary heating means selectively operable in cooperation with the cooling unit to effect dehumidification irrespective of cooling requirements but maintaining a relatively constant temperature while continuing dehumidification.

3,786,860
HEATING AND AIR CONDITIONING SYSTEM
Homer D. Huggins, Racine, Wis., assignor to Modine Manufacturing Company, Racine, Wis.
Filed Oct. 16, 1972, Ser. No. 297,606
Int. Cl. F24d *3/00*
U.S. Cl. 165—50 **9 Claims**



A heating system which may also include a cooling air conditioning section for a multiple unit building such as one of dwelling flats in which the units are adjacent to each other in the completed building such as being on a single floor and are arranged for prefabrication exteriorly of the building before being lifted and fastened into place. The assembly of building units can all be on a single floor and each unit is provided with a hot fluid such as a hot water heat exchanger for heating the air in the unit and the entire building is provided with a generally vertical chimney means of small horizontal extent positioned preferably centrally in the assembly for disposing of flue gases and a single fuel fired heater for the heat exchangers positioned in the chimney and exhausting flue gases thereto for disposal. The heater is vertically elongated and of a small horizontal extent occupying only a fraction of the horizontal area of the chimney with piping for the heated fluid extending from the heater to all of the heat exchangers for heating the exchangers as desired. The heat exchanger may also include an air cooling member such as a refrigerant evaporator coil in the heat exchanger and means for selectively directing air from each unit over the heater portion for heating the air and over the cooling member for cooling the air of each unit as desired.

3,786,861
HEAT PIPES
Philip E. Eggers, Worthington, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio
Filed Apr. 12, 1971, Ser. No. 133,082
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 **11 Claims**

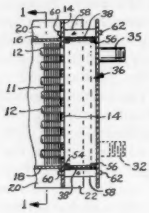


A heat pipe comprising a fluid-tight container 10 for transferring heat from a source 13 adjacent to an evaporation region 14 to a sink 15 adjacent to a condenser region 16, a passage 17 for transferring vapor from the evaporator region to the condenser region, and a wick 18 having high heat conductivity for transferring condensate from the condenser region back to the evaporator region by capillary pumping and for conducting heat from the container in the evaporator region to the evaporation sites 19 and from the condensation sites 20 to the container in the condenser region. The wick comprises a bundle-like arrangement of substantially direct, parallel, substantially uniform capillary channels 21, each about 10^{-4} to 10^{-1} square millimeter in cross-sectional area and having a low rugosity factor, from the condenser region to the evaporator region. Each end 24,26 of the wick forms an angle 25,27 of about 15° to 60° with the adjacent capillary channels, and may have porous surfaces, to provide substantial areas for evaporation and condensation at the ends of the channels.

3,786,862
HEAT EXCHANGE OIL CONSTRUCTION
David Bernard Zipser, and Russell H. Bullard, both of Wilmington, N.C., assignors to The Singer Company, New York, N.Y.
Filed Apr. 30, 1971, Ser. No. 138,957
Int. Cl. F28f *9/14*
U.S. Cl. 165—158 **2 Claims**

A heat exchange coil having a removable header which includes a peripheral rim having edgewise engagement with the

tube sheet. Special clamp devices located outside the rim act to apply controlled compressive forces on an endless deformable seal element squeezably interposed between the edge of the rim and the face of the tube sheet. Total surface area of



the rim edge is small so that a given compressive force provides a comparatively large p.s.i. sealing force. The lessened edge contact area also advantageously minimizes the possibility of leakage due to local surface imperfections such as ridges, bumps, nicks, depressions, etc.

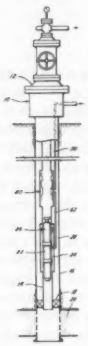
ERRATUM

For Class 165—9 see:
Patent No. 3,786,868

3,786,863
WELL SAFETY VALVE SYSTEM

Gilbert H. Tausch, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Mar. 30, 1973, Ser. No. 346,706
Int. Cl. E21b *41/00*
U.S. Cl. 166—72 **3 Claims**

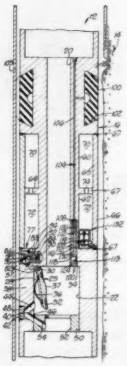


A well safety valve system for controlling the fluid flow through a well tubing in which a retrievable safety valve is positioned in the well tubing by providing a shut-off valve in the tubing above the safety valve which allows the safety valve to be controlled by fluid pressure from the well surface but which closes off the tubing pressure from the surface control fluid for isolating tubing pressure from the control fluid prior to retrieving the safety valve. A safety valve landing nipple connected in the well tubing for receiving the retrievable safety valve. A fluid control line connected between the landing nipple for supplying control fluid through the safety valve, and the shut-off valve connected in the well tubing above the landing nipple. The shut-off valve having first and second ports, the first port connected to the fluid control line leading to the landing nipple, and a second port connected to the control fluid pressure at the well surface. The valve including a valve element for opening and closing communication between the first and second ports.

3,786,864
DRILLING CONTROL DEVICE

August L. Segelhorst, 211 Las Alturas Rd., Santa Barbara, Calif.

Filed Mar. 15, 1972, Ser. No. 234,707
Int. Cl. E21b *33/127, 41/00*
U.S. Cl. 166—187 **9 Claims**

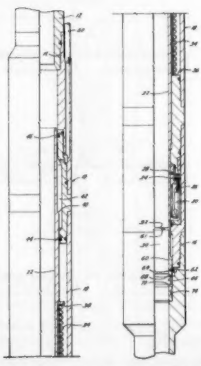


A drilling control device for inclusion in a drill string and serving in place of a short section thereof, embodying an internal bore closure member for closing off the internal well bore in response to sub-surface high-pressure conditions which may be encountered during drilling operations, and a well bore closure member in the form of a normally contracted, expansible packing ring which is expansible in response to the application of fluid pressure thereto from a fluid pressure system operable by the internal bore closure member to seal off the annular space between the drilling control device and the well bore.

3,786,865
LOCKOUT FOR WELL SAFETY VALVE

Gilbert H. Tausch, and Fred E. Watkins, both of Houston, Tex., assignors to Camco Incorporated, Houston, Tex.

Filed Mar. 6, 1973, Ser. No. 338,503
Int. Cl. E21b *43/12*
U.S. Cl. 166—224 S **10 Claims**



In a well safety valve for controlling the fluid flow through a well tubing in which the valve closure means is controlled by

longitudinal movable tubular member, the improvement of lockout means for locking the valve closure member in the open position by providing a second tubular member axially aligned with the first tubular member and normally positioned below the valve closure member. Means on the second member for moving the second member upwardly for holding the valve closure member open. Holding means for holding the second member in the upward position for locking the valve open. The holding means being releasable for resetting and closing the valve if desired.

3,786,866

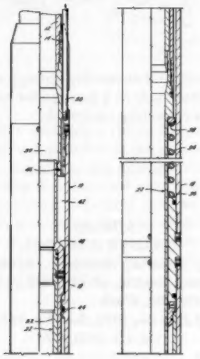
LOCKOUT FOR WELL SAFETY VALVE

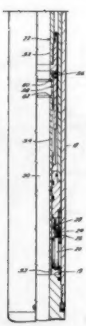
Gilbert H. Tausch, and Fred E. Watkins, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Mar. 6, 1973, Ser. No. 338,502

Int. Cl. E21b *43/12*

U.S. Cl. 166—224 S **14 Claims**





In a well safety valve for controlling the fluid flow through a well tubing in which the valve closure means is controlled by a longitudinal movable tubular member, the improvement of a lockout means for locking the valve closure member in the open position by providing a second tubular member telescoping with the first tubular member and initially secured thereto. Means for preventing inadvertently locking out the valve while the valve is in the open position. Tool engaging means on the second telescoping section for moving the second section downwardly for opening the valve closure member, and holding means for engaging the second section downwardly for locking the valve open. The holding means may include coacting ratchet teeth between the first and second tubular sections and may be releasable if desired. Or the holding means may include coacting ratchet means between the second section and the valve housing. Tool engaging means may be provided on both the first and second sections for moving the second section downwardly by engaging only the tool engaging means on the second section. Or the second section may be moved downwardly by a tool engaging both the first and second sections and moving the first and second sections apart.

3,786,867

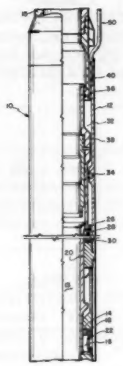
WELL SAFETY VALVE SYSTEM AND METHOD OF OPERATION

Gilbert H. Tausch; Fred E. Watkins, and William H. Dietz, all of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Feb. 23, 1973, Ser. No. 335,229

Int. Cl. E21b *43/12*

U.S. Cl. 166—315 **15 Claims**



A well safety valve which is controlled through a control line leading to the surface which can be set at greater depths in the well by limiting the hydrostatic liquid head in the control line by using gas in the control line and temporarily opening the control line adjacent the lower end for draining the control line of accumulated liquids. Pressurizing the control line with gas while the lower end of the line is open to drive out any liquid therein. A normally closed opening in the control line adjacent the safety valve with means for opening and closing the opening for normally closing the opening for allowing control of the safety valve, but for opening the opening draining any accumulated liquids. A passageway connected between the safety valve and the opening and closing means. The opening and closing means may include various mechanisms such as a sliding sleeve or a sidepocket mandrel having flow control means in the sidepocket for controlling the opening of the passageway.

3,786,868

SELF-COMPENSATING SECTOR PLATE

Harlan E. Finnemore, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

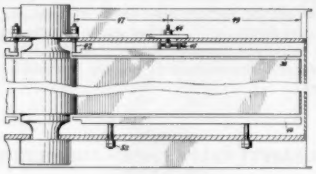
Filed Apr. 24, 1972, Ser. No. 246,957

Int. Cl. F28d *19/04*

U.S. Cl. 165—9 **6 Claims**

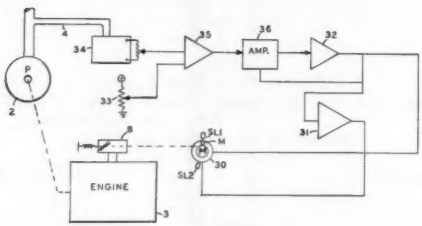
A rotary regenerative heat exchanger having a rotor comprised of heat absorbent material that is alternately exposed to a hot and a cold fluid in order that heat absorbed from the hot fluid may in turn be transferred to the cold fluid. The rotor is surrounded by a housing including a sector plate at opposite

ends of the rotor that separates the several fluids. A pivoted mounting means maintains the sector plate at an optimum



distance from the rotor whereby fluid leakage from the rotor will be reduced to a minimum throughout a wide range of temperature variation and thermal expansion.

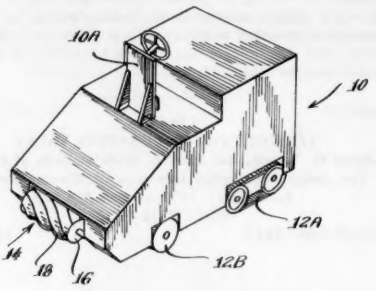
3,786,869
NOZZLE PRESSURE CONTROL SYSTEM
John McLoughlin, 92 Mobrey Ln., Smithtown, N.Y.
Filed Apr. 27, 1972, Ser. No. 248,012
Int. Cl. A62c *27/00*
U.S. Cl. 169—24 **1 Claim**



Hose nozzle pressure control means for a fire engine pumper of the type having a pump driven by a truck engine comprising, engine governor means connected to and responsive to the pump output pressure and engine throttle means to regulate engine speed to maintain pump output pressure, a motorized valve connected between said pump and said hose, and means to control said valve from said nozzle location. The valve control means comprises a transmitter located at said nozzle, a receiver and control means connected to said receiver and responsive to said transmitter to control said valve. The transmitter is connected to said receiver means by wire or by radio.

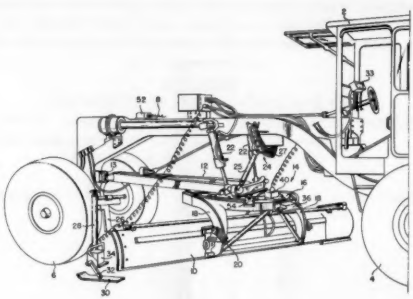
3,786,870
DEBRIS REMOVING APPARATUS
Robert A. List, 33 Coachlamp Ln., Darien, Conn.
Filed Aug. 14, 1972, Ser. No. 280,721
Int. Cl. B07b *1/22*
U.S. Cl. 171—129 **4 Claims**

A device for separating debris, such as wrappers, bottlecaps, cans and the like, from quantities of sand, comprises a rotating drum-sieve with an axis of rotation inclined at an angle to the horizontal so that one end is higher than the other. The drum is supported by peripheral bearings which permit access to central openings at each end. Sand, containing debris is collected and delivered into the opening at the higher end. As the drum rotates, sand passes through the sieve while debris is engaged and lifted by projections on the inner surface. As the projections approach their highest point during rotation of the drum, the debris falls onto an inclined collecting chute which is supported independently of the drum, ex-



tending downwardly and outwardly through the opening at the lower end. The chute acts as a passage for carrying debris out of the drum into a collecting receptacle.

3,786,871
GRADER CONTROL
George E. Long, Monroe; Dennis L. Reese, Kirkland, and Floyd C. Johnson, Seattle, all of Wash., assignors to Grad-Line Inc., Woodinville, Wash.
Filed July 26, 1971, Ser. No. 165,973
Int. Cl. E02f *3/76*
U.S. Cl. 172—4.5 **8 Claims**



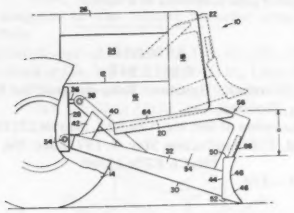
A control system for a road grader adapted to maintain the working edge of the grader blade in a preset datum plane so as to establish a uniform graded condition of the surface worked by the blade, regardless of the inclination assumed by the motor grader or the relative angular position of the blade itself. The system includes grade sensor means mounted adjacent one end of the blade to follow a pre-selected grade datum, slope sensing means mounted in fixed relation with the blade for keeping the blade at a predetermined slope with rotary position sensing means mounted on the blade supporting ring or circle to detect the relative angular position of the blade, and longitudinal grade angle sensing means with rotary position sensing means for altering the control signals to compensate for grade changes and rotary position of the blade.

3,786,872

EXTENSION ASSEMBLY FOR A SKIDDER TRACTOR STACKING BLADE ASSEMBLY

Robert Allyn Rathe, Sherrill, and Lyle Eugene Miller, Dubuque, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sept. 15, 1972, Ser. No. 289,337
Int. Cl. E02f 3/76
U.S. Cl. 172—801 4 Claims



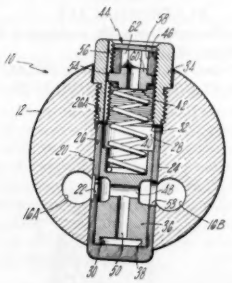
A skidder tractor includes a vertically swingable stacking blade assembly at its forward end, the assembly comprising a pair of push arms located at the opposite sides of the tractor front end and having their forward ends joined by a blade. A stacking blade extension assembly is fixed to the stacking blade assembly for preventing elongate objects such as logs or rocks or the like from passing over the blade into a position whereat they would be disposed between the blade assembly and the underside of the tractor.

3,786,873

STALL TORQUE REGULATOR VALVE FOR FLUID OPERATED POWER TOOL

Hugh L. Whitehouse, Lyndhurst, Ohio, assignor to The Stanley Works, New Britain, Conn.

Filed Apr. 3, 1972, Ser. No. 240,715
Int. Cl. B25b 23/14
U.S. Cl. 173—12 7 Claims



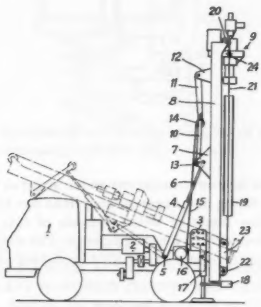
A fluid operated stall type power tool having a fluid supply line including a motor inlet passage, the tool incorporating a normally open stall torque regulator valve in the motor inlet passage, a built-in orifice restriction in the supply line upstream of the stall torque regulator and a modulating spring engaging the valve for maintaining valve travel rate of displacement from its normally open position proportional to the rate of increase in the torque load on the motor during loading of the tool.

3,786,874

UNIVERSAL DRILLING MACHINE

Alain Jodet; Hubert Noret, both of Angers, and Jacques Demichelis, Paris, all of France, assignors to Etat Francais, represented by Ministere de l'Equipement et du Logement, Laboratoire Central Des Ponts Et Chaussees, Paris, France

Filed Apr. 25, 1972, Ser. No. 247,278
Claims priority, application France, Apr. 30, 1971, 7115694
Int. Cl. E21c 1/12
U.S. Cl. 173—49 13 Claims



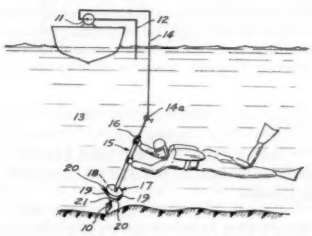
A borer comprises a hammer, a spindle connected to rotate with a rotatable table, and a vibrator connected between the hammer and a support for vibrating the hammer. The spindle is free to rotate with respect to the support. A flexible coupling is arranged between the support and the table.

3,786,875

UNDERWATER ROTATABLE TOOL EQUIPMENT

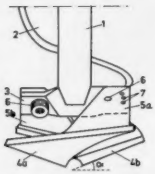
Jean Merle, La Tronche, France, assignor to Societe Grenobloise d'Etudes et d'Applications Hydrauliques, (SOGREAH), Grenoble, France

Filed Feb. 26, 1969, Ser. No. 802,537
Claims priority, application France, Feb. 29, 1968, 685224
Int. Cl. E02b 1/00
U.S. Cl. 173—159 14 Claims



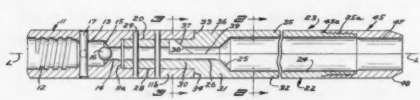
The equipment includes a hydraulic underwater manipulatable, unitary tool connected to one end of a flexible conduit and comprising a rigid member having a chamber in communication with the conduit and with a fluid actuated member rotatably mounted at its inner end on the rigid member. Tool-carrier means are mounted on the outer end of the fluid actuated member. Also mounted on the fluid actuated member between the inner and outer ends thereof are a plurality of nozzles for dispensing the fluid from said chamber into the ambient water, the nozzles being canted so as to impart tool actuating movement to the member upon emergence of the pressurized fluid therefrom.

3,786,876
ICE AUGER
Asseri Akseli Aaltonen, Makelankatu, Hameenlinna, Finland
Filed June 19, 1972, Ser. No. 263,823
Claims priority, application Finland, June 24, 1971, 1805/71; May 26, 1972, 1494/71
Int. Cl. F25c 5/04; E02d 17/14
U.S. Cl. 175—18 6 Claims



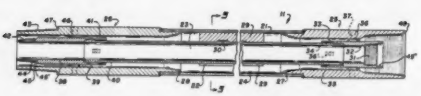
The present invention concerns an ice auger to the shank of which an ice lifting and auger guiding helix has been attached and the cutting blade of which consists of two equal blade pieces provided with an ice-cutting edge. The auger according to the invention is primarily intended for fishing uses.

3,786,877
SOIL SAMPLER APPARATUS
Robert P. Schafer, Golden Valley; Leonard A. Braun, St. Paul, and Terrence C. Maki, Coon Rapids, all of Minn., assignors to Longyear Company, Minneapolis, Minn.
Filed Oct. 25, 1972, Ser. No. 300,476
Int. Cl. E21b 9/20, 25/00
U.S. Cl. 175—249 11 Claims



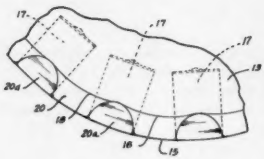
Apparatus for taking soil samples that includes a drive head attachable to the drill rod of a drill rig having a drive hammer, a sample receiving barrel of longitudinally split barrel sections having a reduced diameter end portions extended into the drive head, one of the sections being pinned to the drive head, and a drive shoe threaded on the other end portions of the barrel sections. When the drive shoe is removed, the unpinned barrel section is hingedly movable relative the other barrel section.

3,786,878
DUAL CONCENTRIC DRILLPIPE
Harold Sherman Chapman, 501-320 7th Ave., S.W., Calgary, Alberta, Canada
Filed Dec. 14, 1971, Ser. No. 207,758
Int. Cl. F16l 15/00, 39/00; E21b 43/00, 2/00
U.S. Cl. 175—320 8 Claims



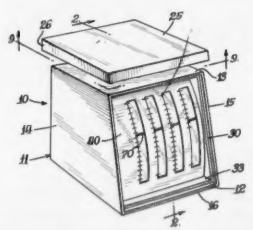
A dual concentric drillstring assembly for use with rotary drilling apparatus and a downhole percussion motor in which the inner and outer pipes of each stand of drillpipe are rigidly secured together by full-length welded webs for minimized reduction in the annulus and maximized heat transfer between the inner and outer members of each stand of dual-wall pipe. Each stand of dual-wall pipe is equipped with web-welded dual box-and-pin tool joints so that coupling rotation of one stand of the drillpipe will simultaneously form two fluid-tight thread-coupled joints; the outer joint is fully thread-coupled while the inner joint is thread-coupled and includes a resilient seal at the interface between adjacent pipe joints so that full make-up of the inner pipe joint is not essential for sealing. For replacement of a worn pipe joint, cutting of the single outer pipe weld permits uncoupling of the dual pipe joint from the inner and outer pipe members of a stand.

3,786,879
DRILL BIT
Henry W. Murdoch, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.
Continuation of Ser. No. 126,833, March 22, 1971, abandoned. This application Mar. 9, 1973, Ser. No. 339,522
Int. Cl. E21c 13/00
U.S. Cl. 175—374 10 Claims



A drill bit including a plurality of roller cutters, each cutter having at least one substantially chisel-shaped circumferential web and hardened inserts positioned therein to allow penetration of the web into the formation being drilled, said inserts having one substantially chisel-shaped end and positioned so that the chisel-shaped surfaces of the web and the inserts present a relatively continuous chisel-shaped surface to the formation. This abstract is neither intended to define the invention of the application, which of course is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,786,880
PLATFORM SCALE
Kert E. Artwick, Morton Grove, Ill., assignor to Hanson Scale Company, Chicago, Ill.
Filed Oct. 25, 1972, Ser. No. 300,485
Int. Cl. G01g 23/14, 23/26, 21/28
U.S. Cl. 177—1 19 Claims



A versatile scale having an easily changed readout face which due to its resiliency may be flexed to forcibly engage a retaining frame positioned adjacent to the scale mechanism indicator which is located behind the scale readout face and thus need not be removed before changing the scale face. The

assembly method of the scale enclosure is designed to require a minimum number of steps and extraneous components since most of the pieces are made such that they snap together. This versatile scale also has an easily interchangeable weight receiving platform such that various arrangements may be used to support or carry the load to be weighed.

3,786,881

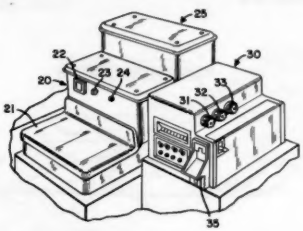
TARE ADJUSTING APPARATUS FOR A COMPUTING SCALE SYSTEM

Kenneth C. Allen, and Edwin E. Boshinski, both of Dayton, Ohio, assignors to The Hobart Manufacturing Company, Troy, Ohio

Continuation-in-part of Ser. No. 85,139, Oct. 29, 1970, which is a division of Ser. No. 422,730, Dec. 31, 1964, Pat. No. 3,557,353. This application Nov. 30, 1972, Ser. No. 310,763

Int. Cl. G01g *23/38, 23/18, 13/14*

U.S. Cl. 177—3 **16 Claims**



Tare adjusting apparatus for a computing scale system wherein tare adjustment is accomplished by manual positioning of an adjustment knob which is connected to turn off a tare signal light when the knob is touched. This requires the operator to adjust the tare before each weighing, or to touch the knob if the tare adjustment is the same as for the previous weighing. Thus there is avoided any inadvertent use of an incorrect tare weight when weighing a product or computing the value thereof. Further there is disclosed an error detecting circuit which causes the tare signal light to be lit if the operator touches the tare adjustment knob while the scale is weighing the product. The touch control feature is implemented by constructing the tare adjustment knob as a part of an oscillation circuit. When the operator touches the tare adjustment knob his body capacitance is introduced into this oscillation circuit. This in turn produces a flipping of the output of a flip-flop which is connected to control the operation of the tare signal light.

For the error detecting embodiment there is provided a logic circuit to control the turning off of the signal light once it has been inadvertently lighted. This logic circuit operates in accordance with one or the other of two disclosed control modes under the joint influence of the output from the tuned oscillation circuit and a signal indicative of the presence of weight on the scale. One control mode requires the operator merely to unload the scale while the other control mode requires him to unload the scale and touch the tare adjusting knob during the unloaded condition.

3,786,882

BUOYANCY WEIGHING SCALES

John Shaw, Winterbourne Down, England, assignor to Glevum Industrial Designers Limited, Gloucester, England

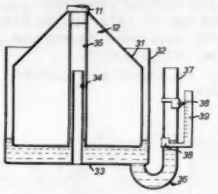
Filed July 24, 1972, Ser. No. 274,245

Claims priority, application Great Britain, July 22, 1971, 34331/71

Int. Cl. G01g *13/24, 5/02*

U.S. Cl. 177—114 **6 Claims**

A balance designed for use in dialysis apparatus includes a float within a container for a liquid. A vessel for treatment solution is connected to the float so that the float moves in dependence on the mass of solution in the vessel. Movement of



the float is determined by sensing the level of liquid in a U-tube which communicates with the container.

3,786,883

ELECTROMAGNETICALLY-COMPENSATED BALANCE HAVING SERIES CONNECTED COILS

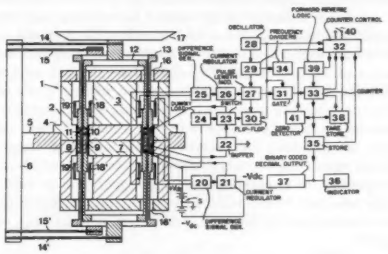
Peter Kunz, Meilen, Switzerland, assignor to Mettler Instrumente, AG, Zurich, Switzerland

Filed Sept. 11, 1972, Ser. No. 287,854

Claims priority, application Switzerland, Sept. 22, 1971, 013867/71

Int. Cl. G01g *7/04, 23/16*

U.S. Cl. 177—164 **13 Claims**

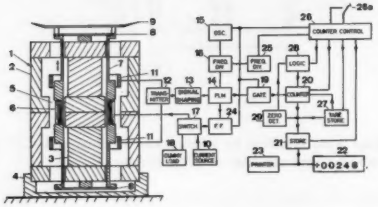


An electromagnetically-compensated balance of the type including load and reference compensation coils for returning load and reference assemblies to their neutral positions relative to the balance housing, characterized in that the reference compensation coil is connected in series with reference current regulating means to define a series branch that is connected at one end with one terminal of a direct-current voltage source. Electronic switch means alternately connect the other end of said series branch in series with, and disconnect said other end of said series branch from, said load compensation coil and said voltage source, respectively. The reference current regulating means are operable by a reference control voltage as a function of the displacement of the reference assembly from its neutral position, and the electronic switch means are operable by a load control voltage to effect series connection between said load and reference compensation coils for time periods that correspond with the displacement of the load assembly from its neutral position. Buffer means are provided for effecting a galvanic coupling between the load and reference coil switching circuits, and stabilizing means—such as a dummy load or a catching diode—are provided for stabilizing the switching operation.

3,786,884
FORCE-MEASURING APPARATUS INCLUDING TOTALIZER MEANS

Heinz Allenspach, Faellenden, Switzerland, assignor to Mettler Instrumente AG, Zurich, Switzerland

Filed Apr. 14, 1972, Ser. No. 244,054
Claims priority, application Switzerland, Apr. 16, 1971, 5947/71; Aug. 30, 1971, 12683/71
Int. Cl. G01g 3/15, 23/42
U.S. Cl. 177—210 9 Claims

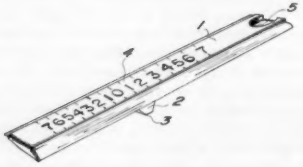


Force-measuring apparatus of the type including electromagnetic compensation means having a movable member that is returned to a no-load position relative to a stationary member by the supply of compensating current pulses of constant amplitude and variable length to a compensation coil secured to said movable member, characterized by the provision of counter means for counting subtotal numbers of counting pulses during periods corresponding with the lengths of said compensating current pulses, respectively, and means including counter control means for periodically transferring to store means the total value of the successive subtotals in the counter means and for simultaneously resetting the counter means to zero. Coarse control means are provided for causing the totalized subtotal pulse count to correspond with a decimal multiple or fraction of a weight unit, and additional store means are provided for optionally indicating for each of a series of subtotal measuring operations the net arithmetic difference between the totalized value and a given pulse reference value (such as tare). According to an alternate embodiment, means including subtotal rate selection switch means are provided for establishing low and high frequency subtotal rates, respectively, and stage selection switch means are operable in conjunction with the operation of said rate switch selection switch means for supplying the counting pulses to corresponding low and high stages, respectively, of the counter.

3,786,885
POSTAGE ESTIMATOR AND RULER

Warren L. Mills, 5742 Maryland Ave., Chicago, Ill.

Filed May 18, 1972, Ser. No. 254,622
Int. Cl. G01g 21/14
U.S. Cl. 177—245 1 Claim

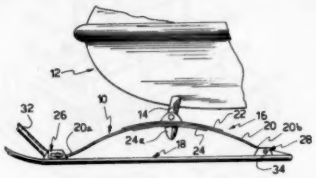


A construction for a postage estimating device and ruler which can be fashioned in one piece without complicated moving parts and will estimate with acceptable accuracy, the amount of postage required on letters and small parcels of varying size and shape and does not require that letters to be weighed are of a predetermined or standard size envelope, as is the case with some similar devices. The construction consists of a ruler, or the like, upon which has been positioned; a fulcrum with flattened point, near the center or balance point of the ruler. Upon the arm of the ruler to the left of the fulcrum, a scale or digram is positioned, with equal distance gradations from zero to seven to the right and zero to seven to the left of a balance point. Upon the ruler to the right of the fulcrum, a slot with open end is carved, to receive a five cents coin, which coin or coins is used as a weight.

3,786,886
BRACKET ASSEMBLY FOR SNOWMOBILE SKIS

Jerome Bombardier, Valcourt, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada

Filed Dec. 20, 1972, Ser. No. 316,727
Int. Cl. B62b 17/04
U.S. Cl. 180—5 R 6 Claims

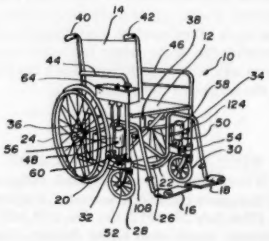


A bracket assembly is mounted on a snowmobile ski runner for slidingly receiving one end of the main leaf of a leaf spring unit and includes: a retaining pin extending connected to the said one end; a sliding block defining a housing for receiving the said one end therein and having opposite side walls with aligned openings for receiving the retaining pin therethrough; and a cover fixed to the ski runner and having an open end for slidingly receiving the block therein, opposite side walls of the cover having longitudinally extending aligned slots allowing the opposite ends of the retaining pin to move freely relative to the cover. In a preferred form, the block is made of plastic material and is constructed to avoid direct contact between the retaining pin and the cover thereby greatly reducing wear and breakage of the parts.

3,786,887
MOTORIZED WHEEL CHAIR DRIVE

Ben J. Rosenthal, 9140 Kildare, Skokie, Ill., and Earl Matsuoka, 206 W. Kathleen, Park Ridge, Ill.

Filed Mar. 20, 1972, Ser. No. 236,040
Int. Cl. B62d 11/04
U.S. Cl. 180—6.5 10 Claims



A motorized drive for a wheel chair includes a motor mounting having an angle bracket with one arm which is

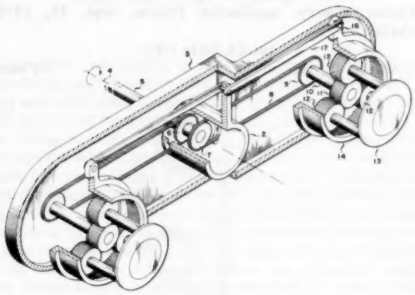
adapted to be secured to the frame of the wheel chair. A mounting plate for the motor is pivotally secured to another arm of the bracket. The motor has a drive wheel which engages a wheel of the wheel chair. A spring biased link holds the motor in a position with respect to the bracket so that the drive wheel bears against the wheel of the chair to propel the same. A control arm pivotally supported on the bracket engages the motor mounting plate to move the same so that the drive wheel is away from the wheel of the chair, to disengage the drive, and releases the mounting plate so that the drive can propel the chair.

3,786,888

TORQUE COMPENSATED WALKING BEAM

Stanley Oscar Nelson, Sunnyvale, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed May 22, 1972, Ser. No. 255,824
Int. Cl. B62d *61/10*
U.S. Cl. 180—24.11 **4 Claims**



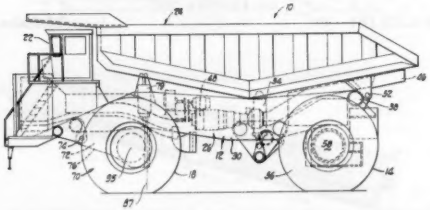
A vehicular walking beam suspension system which provides equal ground pressure on the ground under dynamic conditions is shown. Gear reduction is provided at each wheel hub and the ensuing torque reaction is fed directly back to the vehicle chassis.

3,786,889

STEERABLE LOAD TRANSPORTING VEHICLE

Douglas M. Kelley, Chesterland, Ohio, assignor to Euclid, Inc., Cleveland, Ohio

Filed Feb. 16, 1971, Ser. No. 115,387
Int. Cl. B62d *19/00*; B60g *9/02*
U.S. Cl. 180—44 E **6 Claims**



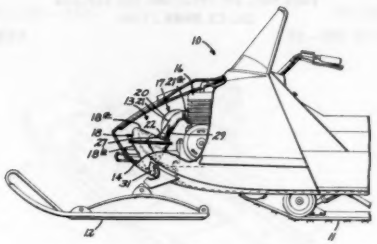
A load transporting vehicle is disclosed which includes a vehicle frame having a narrow forward end and a relatively wide rearward end. Forward and rear wheel assemblies support the frame with the forward wheel assemblies being steerable. A suspension for the forward wheel assemblies provides for pivotal steering motion of each assembly about a steering axis which is spaced from the axis of rotation of the associated wheels and between the associated wheel assembly and the frame.

3,786,890

SNOWMOBILE MUFFLER AND HEADER ASSEMBLY

Gerald G. Shank, Roseau, Minn., assignor to Textron Inc., Providence, R.I.

Filed Dec. 20, 1971, Ser. No. 209,563
Int. Cl. B60k *13/04*
U.S. Cl. 180—64 A **2 Claims**



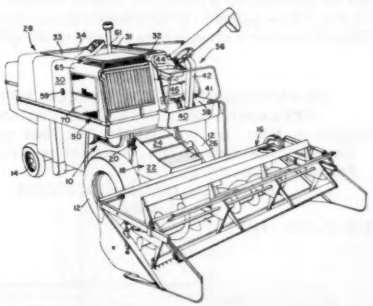
A muffler assembly for a three-cylinder two-cycle snowmobile engine is shown. The assembly is designed to optimize engine output over a broad RPM range while providing improved noise attenuation. Three tubes of generally equal length are connected to the exhaust ports of the engine, and the tubes are connected together into one end of a common joint, which is connected to an exhaust inlet tube of a muffler body having two spaced exhaust outlet tubes.

3,786,891

ENGINE ENCLOSURE FOR A HARVESTING MACHINE

Bernard Francis Vogelaar; James Peter Doering, both of Moline, and Felix Stanley Pasturczak, East Moline, all of Ill., assignors to Deere & Company, Moline, Ill.

Division of Ser. No. 852,689, Aug. 25, 1969, Pat. No. 3,636,684. This application Dec. 21, 1970, Ser. No. 100,542
Int. Cl. B60k *11/04*
U.S. Cl. 180—68 R **23 Claims**



A self-propelled combine has a mobile main separator body with an elevated grain tank mounted on a central portion of the body and a forward operator's station and engine enclosure mounted side-by-side at the forward end of the body immediately in front of the grain tank. The engine enclosure has an air outlet in its outer lateral side and air inlets in both the top and front side of the enclosure. A transversely oriented internal combustion engine is mounted in the enclosure and has a radiator opposite the outlet opening. A fan in the outlet opening draws air through the inlet openings and through the radiator, discharging it through the outlet opening at the side of the combine. The air drawn through the radiator is filtered by means of screens in the air inlets, and the top and front of the enclosure are provided with louvers to deflect part of the air along the surface of the screens to carry away foreign

material collected therein, the contaminated air bypassing the radiator and being discharged out the side of the combine with the cooling air.

3,786,892

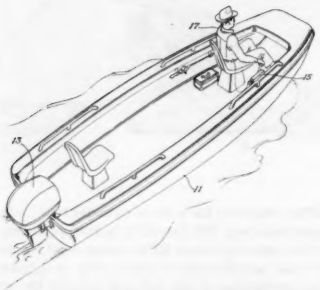
SAFETY CUT-OFF DEVICE FOR IGNITION SWITCH

George F. Horton, Rt. 2, Box 718, Fort Worth, Tex.

Filed Nov. 29, 1972, Ser. No. 310,224

Int. Cl. B60k *27/08*

U.S. Cl. 180—99 **5 Claims**



The specification discloses an ignition switch cut-off device for use on an open type carrier, for example a motor boat, to cut off the engine in the event that the operator is thrown out or falls out of the boat. The cut-off device comprises a control member to be supported in front of the keyhole of the ignition switch housing and having a slot for receiving the ignition switch key when the key is inserted into the keyhole. A housing means is provided for supporting the control member for rotational movement in front of the ignition switch keyhole to allow the key to be inserted through the slot into the ignition switch keyhole and to turn with the key when it is turned to its run and off positions. A flexible pull member is coupled to the control member and is adapted to extend out of the housing means in a manner such that when the key is at its run position and the pull member is pulled, the control member and hence the key will be pulled to its off position to cut off the motor. The pull member is adapted to be coupled to the operator.

3,786,893

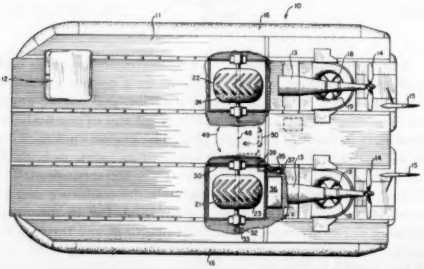
AIR CUSHION VEHICLE WITH SELECTIVELY OPERABLE SURFACE TRACTION MEANS

Douglas D. Joyce, Jr., Williamsville, N.Y., and Anthony Y. Simpson, New Orleans, La., assignors to Textron Inc., Providence, R.I.

Filed Mar. 31, 1971, Ser. No. 176,579

Int. Cl. B60v *3/02*

U.S. Cl. 180—119 **1 Claim**



An air cushion vehicle including a rigid body extended along a longitudinal axis thereof, and means for producing an air cushion thereunder; at least two wheels equipped with inflatable tires, said wheels depending downwardly from the rigid body and each wheel being on an opposite side of and laterally spaced from the longitudinal axis of the vehicle; and said wheels being located in the central third portion longitudinally of the vehicle. Means are provided for causing said wheels to selectively engage the surface underneath the vehicle (whether it be solid, semi-solid, or fluid) and means for driving the wheels independently in the same direction or in opposite directions, and at the same speed or at different speeds. Also, means are provided for selectively braking said wheels, whereby to assist in propulsion of the vehicle on inclined surfaces, and in the steering of the vehicle during maneuverings over ground or water surfaces.

3,786,894

ACOUSTIC SOUNDING INSTRUMENT

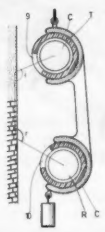
Francisque Lebreton, Paris, France, assignor to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, Hauts-de-Seine, France

Filed Sept. 21, 1971, Ser. No. 182,458

Claims priority, application France, Sept. 21, 1970, 70.34200

Int. Cl. G01v *1/40*

U.S. Cl. 181—.5 BE **4 Claims**



Acoustic sounding instrument for use in determining the acoustic characteristics of the terrain of a borehole includes at least one acoustic emitter and at least one acoustic receiver disposed with the mean cross-sectional planes thereof disposed essentially parallel to the axis of the borehole, the emitter and receiver each being provided with a surface which is essentially a cylindrical surface of revolution through which the waves are emitted and received, respectively.

3,786,895

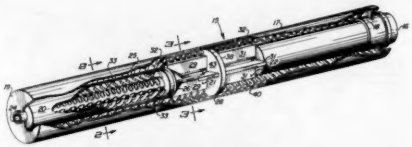
SILENCER FOR GAS DISCHARGING DEVICES

Walter E. Perrine, P.O. Box 66, Navajo, Ariz.

Filed Jan. 18, 1973, Ser. No. 324,850

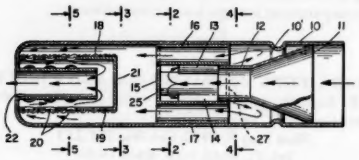
Int. Cl. F01n *1/08*

U.S. Cl. 181—49 **20 Claims**



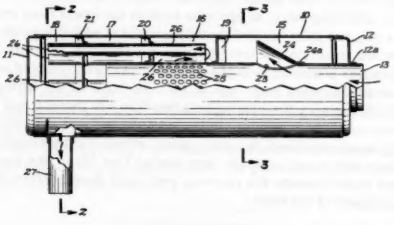
A silencer for muffling of noises in a fluid pressure exhaust system such as the exhaust systems for air operated power cylinders, tools and the like, firearms such as hand weapons, as well as internal combustion engines of the two- and four-cycle type by the utilization of guiding surfaces for directing the gases under pressure into chambers where the gases acquire a rotary or whirling movement about a stationary axis within the silencer and are expelled after such rotary action has dissipated their energy.

3,786,896
MUFFLER
Silvers A. Foster, 20735 Bryant St., Canoga Park, Calif., and Charles F. Smith, 19515 Welby Way, Reseda, Calif.
Continuation-in-part of Ser. No. 282,493, Aug. 21, 1971, Pat. No. 3,754,620. This application May 10, 1973, Ser. No. 358,889
Int. Cl. F01n 1/08
U.S. Cl. 181—53 1 Claim



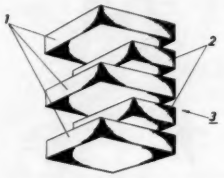
A muffler particularly suited to motorcycles includes a cylindrical casing incorporating a tube assembly comprised of long and short tubes circumferentially spaced about an inner wall portion of the casing. A deflector plate is positioned in the casing to receive and deflect backwardly gases passing through the short tubes. The gases are then caused to reverse again and pass through the long tubes which communicate with the other side of the deflector plate. The cylindrical casing itself includes an annular internal ridge close to the reversal point of the gases to trap carbon particles and thus prevent sparks. Gases exiting from the long pipes then pass through a baffle arrangement at the exit end of the cylindrical casing. The design results in substantial muffling of noise carried along the route of the gases through the muffler.

3,786,897
EXHAUST MUFFLER FOR TWO-STROKE CYCLE ENGINE
Ian N. Swanson, St. Paul, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.
Filed Apr. 12, 1972, Ser. No. 243,349
Int. Cl. F01n 1/08
U.S. Cl. 181—54 8 Claims



A muffler housing with an axial inlet is shown. A tube extends axially into the housing from the inlet. A closed tuning chamber is provided in the housing surrounding the tube adjacent the inlet end. The tube has a single opening leading to the tuning chamber. A louver is mounted on the tube in the chamber to extend over the opening. The louver acts as a megaphone portion to enhance performance of the two cycle engine. The housing is provided with baffles and chambers downstream from the tuning chamber to muffle exhaust noises and further enhance performance of the engine.

3,786,898
MUFFLING BLOCK
Shozo Fujii, Tokyo, Japan, assignor to Kabushiki Kaisha Fujii Kogyo, Tokyo, Japan
Filed Dec. 15, 1972, Ser. No. 315,483
Claims priority, application Japan, Sept. 6, 1972, 47-103249
Int. Cl. E04b 1/84
U.S. Cl. 181—33 G 10 Claims

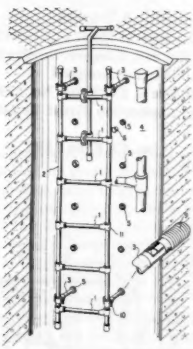


Sound-absorbing blocks of box-like shape are combined to form a unit. The unit consists of two kinds of blocks, one being shorter and having a lower density than the other. In use, every unit is fixed to a wall or ceiling so that a discontinuous side of each unit faces away from the surface of the wall or ceiling and a smooth side thereof is fixed to the latter. Every unit consists of four or five sound-absorbing blocks which latter are made of a fiber material.

One of the features of this invention is that the unit can be adapted for use in a rather wide sound-absorbing chamber by making the walls thin.

Another feature is that the structure of the sound-absorbing unit is so simple that the manufacturing cost is very low.

3,786,899
LADDER
Heinrich Zenhausern, Birmensdorferstrasse 134, Urdorf, Switzerland
Filed Aug. 24, 1971, Ser. No. 174,441
Claims priority, application Switzerland, Aug. 27, 1970, 12964/70
Int. Cl. E06c 9/02, 7/08
U.S. Cl. 182—93 1 Claim



A ladder comprises two stringers, a plurality of rungs and fastening elements for fastening said ladder to structure, said fastening elements and said rungs being provided, at their ends with external toothing and the stringers carrying a plurality of shiftable and clampable connecting elements some of which are provided with a blind bores for receiving ends of said rungs and others of which are provided with bores for receiving ends of said fastening elements.

3,786,900

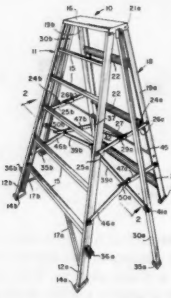
LATERALLY STABILIZED STEPLADDER

Paul J. Olsen, 19511 Almaden Rd., San Jose, Calif.

Continuation-in-part of Ser. No. 159,115, July 2, 1971, abandoned. This application Feb. 25, 1972, Ser. No. 229,438

Int. Cl. E06c 1/22

U.S. Cl. 182—172 5 Claims



A foldable stepladder having stabilizer structure as a part thereof to provide the stepladder with lateral stability. The stepladder may be a generally conventional stepladder foldable between open and closed positions and equipped along the sides thereof with stabilizer components that are laterally movable between inner retracted and outer extended positions, and operative in the latter positions thereof to inhibit lateral tipping of the stepladder in each direction. The movable stabilizer components are elongated support legs pivotally connected with the stepladder adjacent the upper end thereof, and selectively movable between inner retracted positions in which they are held by retainer structure in general juxtaposition with the side edges of the ladder and outer positions in which they are constrained by tie structure that prevents movement of the support legs in both lateral and transverse directions. The movable support legs are also adjustable in length to accommodate irregular surfaces, and they may be used individually or together so as to permit the ladder to accommodate any particular environmental conditions during use thereof.

3,786,901

SEALED LUBRICATING SYSTEM MODULE

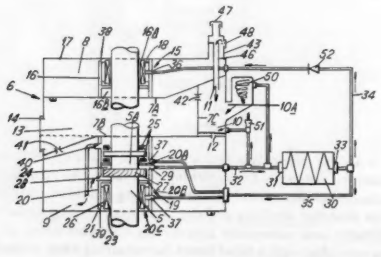
Forrest Thomson Randell, Glasgow, Scotland, assignor to Weir Pumps Limited, Cathcart, Scotland

Filed June 2, 1972, Ser. No. 259,259

Claims priority, application Great Britain, June 3, 1971, 18,804/71

Int. Cl. F16n 1/00

U.S. Cl. 184—6.18 17 Claims



Rotodynamic apparatus includes a pair of spaced upper and lower rotodynamic machines such as for example an upper pump and a lower drive turbine for the pump, and upright shafting drivingly interconnecting the machines.

Lubricated bearing means are provided to support the upright shafting and comprises a closed vessel adapted to permit the extension therethrough of the shafting and which includes upper and lower compartments for bearing lubricant and ducting interconnecting the compartments, upper and lower shaft-engaging bearing devices in the respective compartments, and a lubricant circulator having an inlet communicating with the lower compartment and an outlet communicating with the bearing devices, the arrangement being such that lubricant flows from the lower compartment through the bearing devices into the compartments and overflows from the upper compartment into the lower compartment.

3,786,902

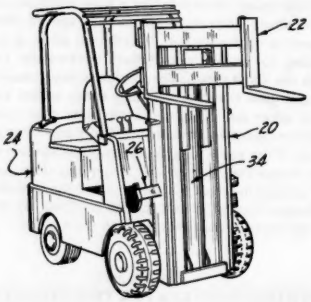
LOAD-LIFTING MECHANISM FOR A LIFT TRUCK

Keith E. Ramsey, Jackson, Mich., assignor to The Knickerbocker Company, Jackson, Mich.

Filed May 8, 1972, Ser. No. 251,253

Int. Cl. B66b 9/20; B66c 19/00

U.S. Cl. 187—9 29 Claims



A load-lifting mechanism for lift trucks in which an extensible three-stage mast carries a load-lifting carriage and is vertically actuated by a hydraulic ram and associated load-lifting chains. A simple piston and cylinder ram operates to elevate the carriage through a full free lift travel on the upper, inner mast section in the collapsed condition of the mast via a system of two sets of chains and associated lifting bar and lifting bracket. One set of chains is trained over the piston of the ram and coupled at its opposite ends to the lower mast section via the ram cylinder and the lifting bracket which is guided for limited travel on the intermediate mast section. The other set of chains is trained over the lifting bracket and coupled at one end to the inner mast and at its other end to the lifting bar which engages the carriage during free lift thereof and then couples to the stationary outer mast via the ram cylinder during mast extension. A latch system automatically couples the inner and outer mast sections during free lift of the carriage and interconnects the carriage and inner mast section during extension of the mast.

3,786,903

CLUTCH RELEASE CYLINDER FOR VEHICLES

Shoji Haga, and Junichi Komorizono, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seihi Kabushiki Kaisha, both of Aichi-ken, Japan

Filed Feb. 1, 1972, Ser. No. 222,565

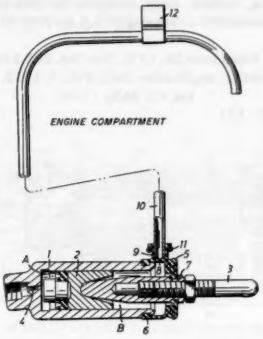
Claims priority, application Japan, Feb. 3, 1971, 46/5067

Int. Cl. F16d 25/00

U.S. Cl. 192—91 R 2 Claims

A clutch releasing mechanism of the type including a cylinder housing and the rod of a piston slidable therein,

sealed by folding bellows which hermetically enclose one end of the cylinder housing and the piston rod, and wherein is provided elongated passage means connecting the air chamber formed between the piston and bellows to the atmosphere so as to prevent entrance of dust, dirt and water.



3,786,904

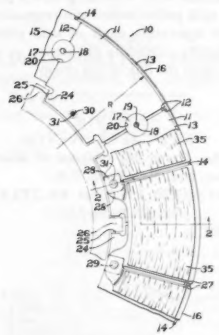
SEGMENTED FRICTION MEMBER ASSEMBLY

Marvin E. Hotchkiss, Troy, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed June 23, 1972, Ser. No. 265,528

Int. Cl. F16d *13/64*

U.S. Cl. 192—107 R **2 Claims**



A segmented friction member assembly for a disc type brake or clutch having a continuous band extending around the peripheral surfaces of the heat-absorbing segments and between the radially outer edges of the segmental facing members. The band provides radial restraint and resists rotation of the heat-absorbing segments due to torque forces applied during operation of the assembly.

3,786,905

DEVICE FOR THE INDIVIDUAL ADJUSTMENT OF THE STRIKING FORCE IN A TYPEWRITER

Georges Costa, Yverdon, Switzerland, assignor to Paillard S.A., Sainte Croix Vaud, Switzerland

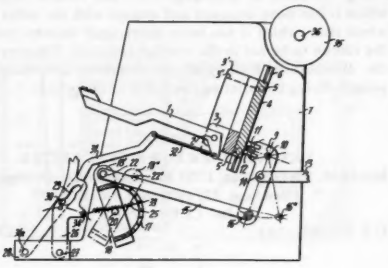
Filed Dec. 1, 1971, Ser. No. 203,716

Claims priority, application Switzerland, Dec. 15, 1970, 18599/70

Int. Cl. B41j *23/08*

U.S. Cl. 197—17 **1 Claim**

An adjusting spring is associated with each type bar acting as a function of the movement, so as to increase, maintain or reduce the striking force. Each of the springs is attached by one of its ends to a movable element of the actuating system of the corresponding type bar and by its other end to anchoring means at an adjustable position of a member movable as a function of the movement. The movable member is an elongated part capable of pivoting around an axis parallel to the platen of the machine, capable of taking up two positions corresponding to the lower case and upper case positions respectively of the movement. The movable member has a U-shaped section and its surface has series of slots corresponding in number to the number of type bars, each slot having a series of notches forming fixing points for the adjusting springs.



3,786,906

PRINTING RIBBON FEEDING MECHANISM IN A PRINTER

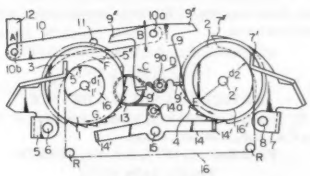
Katsuhiko Okabe, Tokorozawa, Japan, assignor to Kabushikikaisha Copal, Itabashi-ku, Tokyo, Japan

Filed July 11, 1972, Ser. No. 270,865

Claims priority, application Japan, July 19, 1971, 46-63647

Int. Cl. B41j *33/44*

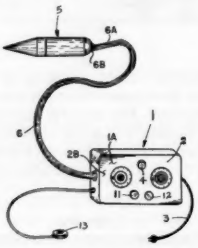
U.S. Cl. 197—161 **4 Claims**



Printing ribbon feeding mechanism in a printer having a pair of ribbon reel supporting shafts alternately driven in the opposite directions to each other so as to feed the printing ribbon from a reel supported on one of the shafts to a reel supported on the other shaft and vice versa. The feeding mechanism has a ratchet feeding member reciprocably moved between a pair of ratchet wheels secured to the shafts, respectively, each time the printing operation is effected, and swingable to alternately engage with either of the ratchet for driving the same, a detent member alternately engageable with either of the ratchet wheels so as to prevent the reverse rotation of the same, a compression spring connecting the ratchet feeding member to the detent member so that, when the ratchet feeding member engages with either one of the ratchet wheels, the detent member is also engaged with the ratchet wheel with which the ratchet feeding member engages, whereas, when the ratchet feeding member is swung to engage with the other ratchet wheel, the detent member is also swung to engage with the other ratchet wheel with which the ratchet feeding member engages, and a pair of detecting levers each adapted to detect

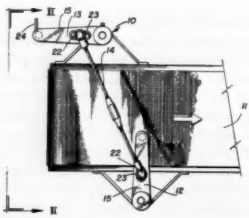
the amount of the ribbon wound on the reel which is mounted on the respective shaft and cooperating with the ratchet feeding member so that, when the diameter of the coil of ribbon on either of the reels is reduced to a predetermined value, the detecting lever detecting the diameter reduced to the predetermined value engages with the ratchet feeding member so as to swing the same to disengage from the ratchet wheel with which it has been engaged and engage with the other ratchet wheel from which it has been disengaged thereby permitting the ribbon to be fed in the reverse direction. The reversing of the direction of feeding of the ribbon is automatically repeated during the printing operation of the printer.

3,786,907
LASER ERASER FOR A TYPEWRITER
Hrand M. Muncheryan, 1735 Morningside St., Orange, Calif.
Filed Sept. 22, 1971, Ser. No. 182,597
Int. Cl. B41j *29/16*
U.S. Cl. 197—181 **17 Claims**



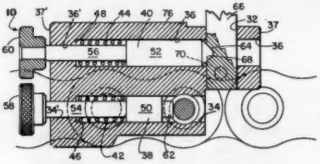
A laser eraser for erasing errors from a written document and adapted with means to be permanently incorporated on a typewriter is described. The device comprises a laser instrumentation head containing a laser generator, a power supply unit to energize said laser generator, and a conduit means connecting the laser instrumentation head to the power supply unit for electrical communication therebetween and for electronic and fluid cooling of the laser generator in said laser instrumentation head.

3,786,908
ARTICLE HANDLING DEVICE
Charles H. Jones, Lunemburg, Mass., assignor to Van Brode Milling Co., Inc., Clinton, Mass.
Filed Sept. 1, 1972, Ser. No. 285,876
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AB **9 Claims**



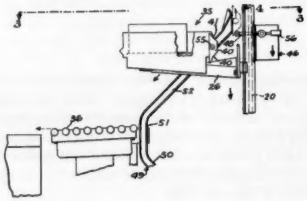
An article handling device for turning an article moving along a conveyor, so that the longitudinal dimension of the article is oriented from a position perpendicular to the direction of motion to a position parallel to the direction of motion; a downstream gate cams the article around and is pushed out of the path of motion; the movement of the gate draws a following gate over the conveyor for final orientation of the article.

3,786,909
PALLET COUPLING DEVICE FOR CHAIN TYPE CONVEYORS
Glauco Reda, Milano, Italy, assignor to Officina Tecnomeccanica Esecuzioni e Montaggi S.p.A. (O.T.E.M.), Milano, Italy
Filed June 26, 1972, Ser. No. 266,228
Claims priority, application Italy, Feb. 4, 1972, 20202 A/72
Int. Cl. B65g *17/00*
U.S. Cl. 198—131 **15 Claims**



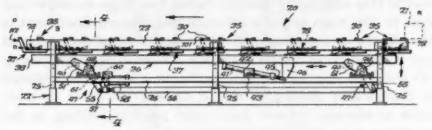
A pallet coupling device for chain type conveyors including a body and a support pin journaled therein and constrained axially relative thereto. The support pin is insertable within the hollow roller of said conveyor chain for rotation therein. The body has a pair of offset passageways, one for receiving said support pin and the second having its long axis normal to the first for receiving a pallet dog or holder pin. A pair of parallel sockets are provided in the body arranged normal to said passageway pair and respectively intercepting each of said passageways. Spring biased spindles or plungers are received within said respective sockets with their free ends biased in engagement with annular grooves provided on said support pin and said pallet holder pin respectively. Actuators are provided for operating each of said plungers independently. An outwardly extending projection or peg is provided for engagement upon the link of the chain.

3,786,910
VERTICAL CONVEYOR
Charles W. Wallis, Cary, Ill., assignor to American Chain & Cable Company, Inc., New York, N.Y.
Filed July 20, 1972, Ser. No. 273,520
Int. Cl. B65g *15/00*
U.S. Cl. 198—158 **16 Claims**



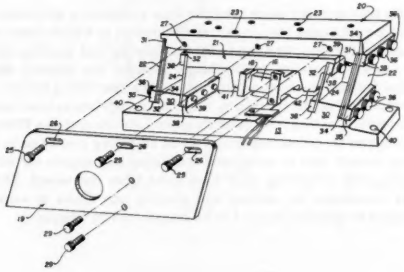
An endless vertical conveyor having a vertical reach, carriers mounted on the conveyor at longitudinally spaced points including a base and an article support mounted on each said base and movable transversely such that it can be positioned adjacent a loading or unloading station as the conveyor moves vertically. Each article support includes a cam that is engaged by an actuator selectively to move the article support transversely such that it will be adjacent the loading or unloading station. Guide means are provided for engaging a roller on the article support and guiding the article support to and from the station as the conveyor moves vertically.

3,786,911
ACCUMULATING TRANSFER CONVEYOR
Carl J. Milazzo, Tonawanda, N.Y., assignor to Hohl Machine & Conveyor Co., Inc., Buffalo, N.Y.
Filed Aug. 1, 1972, Ser. No. 276,980
Int. Cl. B65g 25/04
U.S. Cl. 198—219 18 Claims



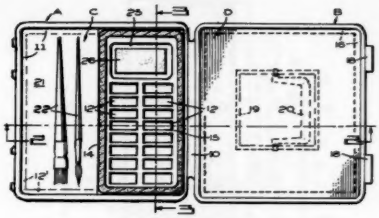
A plurality of article transfer mechanisms are mounted on a carriage for movement therewith in a rectangular path relative to a conveyor frame and, when in their operative positions, are adapted to advance articles from rest positions on the frame to successive next adjacent rest positions toward the conveyor discharge. An article sensing arm at each rest position, connected to a disabling arm, is responsive to the presence of an article at that position to displace the disabling arm in a manner maintaining the associated transfer mechanism in a disabled condition, precluding transfer of the preceding article to the blocked position.

3,786,912
LINEAR VIBRATORY FEEDER
William C. Taylor, Waterford, Pa., assignor to Automation Devices, Inc., Fairview, Pa.
Filed Nov. 20, 1970, Ser. No. 91,494
Int. Cl. B65g 27/00
U.S. Cl. 198—220 CC 9 Claims



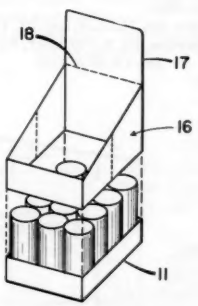
A linear vibratory feeder is disclosed in which an action mass is positioned above a reaction mass, both of which are secured to a base by means of leaf type springs. Side plates are secured to the upper or action mass to which the coil is attached. The armature is secured to the underneath portion of the reaction mass, and the coil also mounted beneath the reaction mass to render the centers of gravity of the action and reaction masses substantially coincidental. Means are provided to adjust the gap between the armature and coil, and the action mass center of gravity is ideally located slightly below the center of gravity of the reaction mass to accommodate a track which is mounted atop the action mass.

3,786,913
ARTIST'S PAINT BOX
Donald Crawford, 2211 Coronet Blvd., Belmont, Calif.
Filed Dec. 4, 1972, Ser. No. 311,554
Int. Cl. B65d 1/34, 25/02, 53/00, 85/54
U.S. Cl. 206—1.8 6 Claims



An artist's paint box wherein a box body has a lid hinged thereto for closing and opening movements, and a tray is mounted in the box body and has a group of paint-receiving compartments with an endless sealing ring surrounding these compartments. A palette is fixed to the lid in a position to abut flatwise against the sealing ring when the lid is closed, thereby preventing the paints from drying out. Moreover, a sponge-receiving compartment is formed in the tray for holding a wet sponge, whereby moisture may be conveyed to the paints to add moisture thereto. The tray is made to hold brushes, while the box body below the mounted tray provides for storage of paint tubes.

3,786,914
SHIPPING AND DISPLAY CARTON
Hervey F. Beutler, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Filed June 7, 1972, Ser. No. 260,675
Int. Cl. B65d 5/52
U.S. Cl. 206—44 R 5 Claims



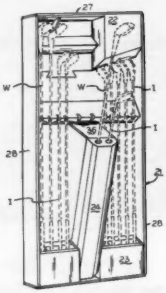
Shipping and display carton combination comprising a rectangular box, having a tear strip around all four sides spaced from bottom to allow top and top portions of sides to be removed leaving a tray and exposing contents. A sleeve foldable into the box and dimensioned to fit around tray, is slipped over the tray and held unfolded by the tray and a rigidifying rib.

3,786,915

DISPLAY PACKAGE FOR ELONGATED ARTICLES

Herbert M. Potts, Yulee, and Maynard A. Trutna, Jacksonville, both of Fla., assignors to Container Corporation of America, Chicago, Ill.

Filed June 8, 1972, Ser. No. 260,988
Int. Cl. B65d 5/50
U.S. Cl. 206—45.15 9 Claims



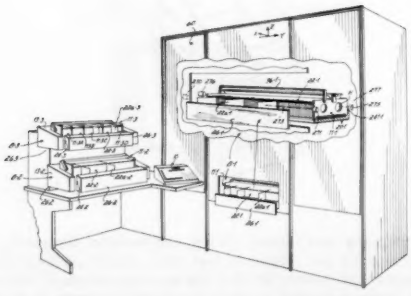
A display package for elongated articles such as golf clubs is formed from a plurality of cut and scored blanks of paperboard or the like. These are formed to comprise a walled tray having a main panel and side and end walls extending from the main panel. A first insert is placed into the tray and is formed from a cut, scored and folded blank and is disposed in the tray adjacent one end thereof and is adapted to position upper extremities of certain of the elongated articles. A second insert is placed in the tray and is formed from a cut, scored and folded blank, and it is disposed in the tray adjacent the opposite end thereof for positioning opposite extremities of certain of the articles. An elongated tube is formed from a cut, scored and folded blank for positioning of other of the elongated articles, and structure is provided for securing the elongated tube in position and pivotally supporting the same so that the tube lies selectively within the tray or in an inclined position with respect thereto for display.

3,786,916

DOCUMENT RETRIEVAL APPARATUS AND METHOD

Richard C. O'Brien, Dayton, Ohio, assignor to O. K. Partnership, Cincinnati, Ohio

Continuation of Ser. No. 213,325, Dec. 29, 1971, abandoned.
This application Jan. 9, 1973, Ser. No. 322,185
Int. Cl. B07c 5/36
U.S. Cl. 209—80.5 17 Claims



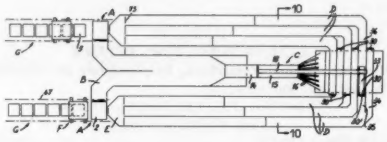
A document retrieval apparatus and method having a plurality of movable trays each containing encoded documents which are normally stored in addressable crypts arranged in two opposed, spaced matrices with the crypt openings of respective matrices in common vertical planes, a main document selector designed to select a desired document from among a tray of encoded documents transported thereto, and a tray transport movable in the space between the crypt matrices, the main selector and the crypt openings for transferring trays of encoded documents between their respective crypts and the main selector, and a keyboard control console which in response to entry of data identifying a document in a specific tray effects the transfer of the tray from its respective crypt to the main selector whereat the desired document is then ejected by the selector from among those of the retrieved tray. A second, or buffer, selector, which is searched along with the main selector when a document is sought, is provided for temporarily storing retrieved documents prior to their return to storage, or new documents prior to infiling, in the movable trays stored in the crypts.

3,786,917

FRUIT-GRADING PLANT

Claude Joseph Rousselie, Saint Sylvain D'Anjou, and Pierre Lacharlotte, Ecouflant, both of France, assignors to S. I. C. A. "Pomanjou", Ecouflant, Maine et Loire, France

Filed Feb. 4, 1972, Ser. No. 223,470
Claims priority, application France, Feb. 16, 1971, 71.06558
Int. Cl. B07c 7/00
U.S. Cl. 209—123 8 Claims



This fruit grading plant is of the type comprising an immersion-type emptying station, a transfer trough in which water is circulated for directing the fruits to a sorting and grading station, and a plurality of discharge troughs for feeding the graded fruits of each grade and/or size to a case filling station.

According to this invention, the plant comprises at least one vessel which, acting both as an emptying station and as a filling station, can be connected either to an emptying circuit or to a filling circuit, and is associated with handling means for immersing and retracting each case in or from the vessel. This plant is suitable for sorting and grading any fruits or other products or articles adapted to be transferred by buoyancy.

3,786,918

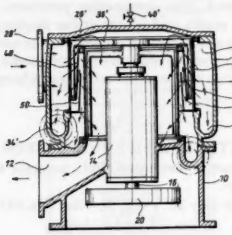
PRESSURE FILTER FOR FIBROUS SUSPENSIONS

Emil Holz, Eningen/Wurttenberg, Germany, assignor to Hermann Finckh Metalltuch-und Maschinenfabrik, Reutlingen/Wurtt, Germany

Filed Aug. 27, 1971, Ser. No. 175,625
Claims priority, application Germany, Aug. 16, 1971, 7131281
Int. Cl. B07b 1/04; B01d 29/26
U.S. Cl. 209—273 6 Claims

A pressure filter for fibrous suspensions including a multiple component housing within which at least one stationary

upright filter basket is disposed. The housing is divided into an upper housing section and a lower housing section with a



stock inlet in the upper housing section and a stock outlet in the lower housing section, and with the stationary basket being supported by the lower housing section.

3,786,919

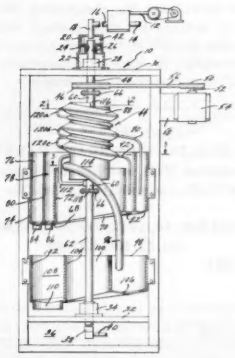
METHOD AND APPARATUS FOR CONCENTRATING ORE PULPS

Dewitt C. Deringer, Golden, Colo., assignor to Ben H. Parker, Jr., Sao Paulo, Brazil

Filed Dec. 13, 1971, Ser. No. 207,386

Int. Cl. B03b *3/10*

U.S. Cl. 209—434 **5 Claims**



This invention relates to a centrifugal ore concentrator characterized by a spirally wound tunnel-forming member wound about a rotatable core into which an ore pulp is introduced. As the ore pulp gravitates, or is preferably forced, through the whirling spiral, the heavy minerals that have migrated to the outside of the tunnel under the influence of the centrifugal action are drawn off and separated from the lighter gangue particles that are similarly drawn off from the inside. The invention also encompasses the novel method of concentrating ore pulps which comprises feeding the pulp through a rotating spirally disposed tunnel with a pulsating action, dividing the stream and drawing off the heavier material from the outside and the lighter material from the inside.

3,786,920

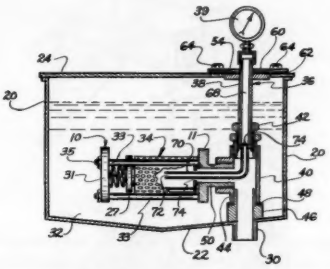
FILTER APPARATUS FOR HYDRAULIC SYSTEM

Robert E. Raymond, Zanesville, Ohio, assignor to International Basic Economy Corporation, New York, N.Y.

Continuation of Ser. No. 103,176, Dec. 31, 1970, abandoned. This application June 26, 1972, Ser. No. 266,417

Int. Cl. B01d *35/14*

U.S. Cl. 210—90 **2 Claims**



A filter for a hydraulic system which filter is mounted within the reservoir containing the hydraulic fluid supply. The filter comprises a yieldably mounted cylinder element that is normally biased towards a closed filtering position, said filter element being adapted to yield to an open position at such times as porous side walls of the filter element become clogged to the extent that a predetermined back pressure is imposed by the filter element on the flow passing therethrough. The apparatus is further characterized by a filter condition sensing and indicating means that senses only that pressure build-up within the filter element which is caused by clogging of the porous walls of the element. Hence, false condition indications due to flow surges inherent in filtered systems are eliminated.

3,786,921

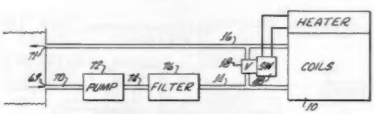
HEATER BYPASS AND SHUT-OFF VALVE

Charles S. Johnson, Laguna Niguel, Calif., assignor to Baker Hydro, Inc., Santa Ana, Calif.

Filed Feb. 14, 1972, Ser. No. 226,115

Int. Cl. B01d *35/14*

U.S. Cl. 210—130 **6 Claims**



A shut-off device for a heater for water in continuous circulation, as in the filtering line for a swimming pool, is disclosed. The flow of water through the system is monitored by a bypass connected between the input and the output of the heater, shunting the coils in the heater. A spring-loaded valve is mounted in the bypass so as to close the bypass except when the flow of water to the heater input exceeds that required to maintain a desired minimum flow through the heater. The valve controls a heater disabling device, so that the heater may be on only when the bypass valve is open.

3,786,922

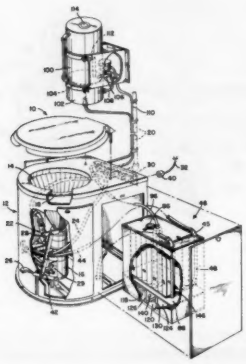
WASTE TREATMENT SYSTEM WITH ENCLOSED SCREEN UNIT

Vincent Materese, Dayton, Ohio, assignor to Dayton Manufacturing Company, Dayton, Ohio

Continuation-in-part of Ser. No. 196,092, Nov. 5, 1971. This application July 31, 1972, Ser. No. 276,518

Int. Cl. C02c *1/40*

U.S. Cl. 210—136 9 Claims



A waste treatment system including means for grinding solid wastes, mixing them with liquid to form a pumpable slurry and pumping the slurry to a waste treatment tank. The waste treatment tank includes a screening section in which an enclosed screen unit is loosely received. The slurry is pumped to the interior of the screen unit for flow outwardly through the foraminous side walls thereof and thence, into a mixing section of the treatment tank. The screened waste material is mixed with chemical additives as it passes from the screening section of the treatment tank to the mixing section and a series of perforated baffles in the mixing section insure that the additives and screened waste material are intimately mixed and retained in the tank for a sufficient period of time to render the mixture pathogenically harmless before it is ejected from an outlet from the mixing section of the treatment tank.

3,786,923

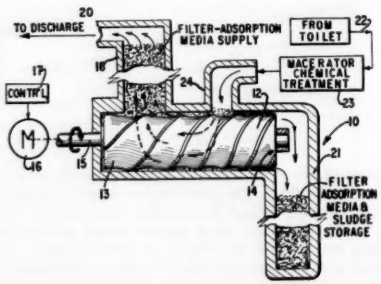
MARINE WASTE DISPOSAL APPARATUS

Ferenc J. Schmidt, Ardmore, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed July 26, 1971, Ser. No. 166,132

Int. Cl. B01d *33/30*

U.S. Cl. 210—152 1 Claim



A filter-adsorption media, such as activated carbon, is supplied to one end of a screw conveyor having a variable pitch along its length with the greater pitch being at the supply end. Sewage, such as from a marine toilet, is passed through a macerator and chemically treated before being introduced into the central portion of the screw conveyor to be mixed with the filter-adsorption media and compacted as the screw conveyor is rotated. The compacting produces a mixture of filter-adsorption media and sludge at the discharge end while the liquid is passed through the conveyor in counter-flow relationship, to the incoming filter-adsorption media and through the filter-adsorption media, and then to a discharge.

3,786,924

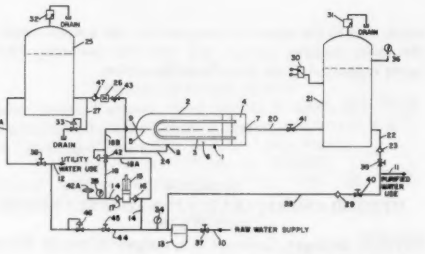
WATER PURIFICATION SYSTEM

Lowell E. Huffman, Wilmington, Del., assignor to Delro Inc., New Castle, Del.

Filed July 22, 1971, Ser. No. 164,991

Int. Cl. B01d *31/00*

U.S. Cl. 210—257 14 Claims



A water purification system incorporating a reverse osmosis unit for purifying water is disclosed. The system yields two streams, one of very high purity for drinking and cooking and the like and one of lower quality for use in toilet tanks, lawn watering, garden irrigation and the like. The system provides apparatus and techniques for reconciling the varying flow rates inherent in a domestic water system with the constant flow rate desirable for efficient performance of the reverse osmosis unit. Provision is made for automatic flushing and backwashing of the reverse osmosis element.

3,786,925

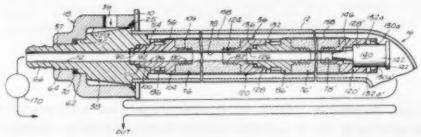
MEANS FOR SEALING MEMBRANE CARRYING TUBES

Leo Block, Woodland Hills, and Frank R. Shippey, Thousand Oaks, both of Calif., assignors to Raypak, Inc., Westlake Village, Calif.

Filed Feb. 14, 1972, Ser. No. 225,945

Int. Cl. B01d *31/00*

U.S. Cl. 210—321 6 Claims



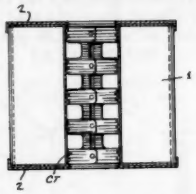
An osmotic membrane bridges over the joint between an end core fitting and the end of a tubular porous core member and alloys with the material of the core fitting. The joints may be between modules joined or coupled by male and female plastic core fittings linked together by bayonet joints. This assembly is adapted to use in reverse osmosis machines with the joined modules in a tubular shell forming an annulus with concentrate in the annulus under pressure. The bayonet joints prevent pulling apart of the modules.

3,786,926

PAPER FILTER ELEMENT CENTER TUBE

John R. Wilhelm, Perth Amboy, N.J., assignor to Purolator, Inc., Rahway, N.J.

Filed Nov. 17, 1971, Ser. No. 199,565
Int. Cl. B01d 29/04
U.S. Cl. 210—497 1 Claim



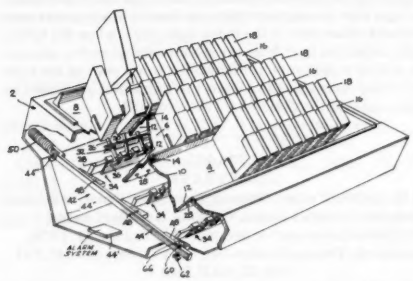
Annular filter elements for outside-in operation ordinarily include a center tube for support against inward collapse, and this disclosure concerns a center tube formed from a flat sheet metal stamping including a longitudinally extended backbone and interspaced ribs extending laterally from this backbone and having free ends, the stamping being formed into a cylinder with the backbone extending axially and the ribs extending circumferentially and their free ends fastened.

3,786,927

PILFER PROOF DISPLAY UNIT FOR PACK MERCHANDISE

Jay Manheim, 860 United Nations Plaza, New York, N.Y.

Filed Sept. 7, 1971, Ser. No. 178,039
Int. Cl. A47f 7/00
U.S. Cl. 211—4 15 Claims



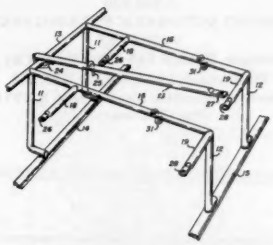
A display unit for merchandise in packs which is intended to prevent pilfering. The unit includes a housing for supporting a plurality of holders. Each holder is adapted to hold one of the packs and to permit its removal upon movement of the pack in a predetermined path relative to the holder. Each holder is connected with the housing for pivoting motion about a generally horizontal pivot axis, to facilitate browsing. Each pack is normally prevented from removal from its holder by a limit member connected with the housing projecting into the predetermined path of the pack from its holder when the holder is in a secured, first position, which limits movement of the pack to less than that necessary for removal. Each holder can, however, be tilted about a tilt axis generally perpendicular to the pivot axis to a released, second position in which the predetermined path of removal of the pack relative to the holder is moved out of the way of the limit member so that the pack can be removed. Tilting of the holders to the released position is normally prevented by a selectively operable, concealed keeper hidden within the housing.

3,786,928

BICYCLE RACK

J. Robert Johnson, 13090 Alta Ln. North, Los Altos Hills, Calif.

Filed Apr. 17, 1972, Ser. No. 244,476
Int. Cl. E05b 73/00
U.S. Cl. 211—5 5 Claims



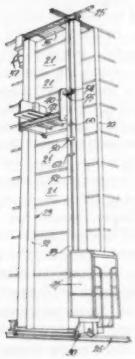
The bicycle rack of this invention provides a supporting structure having a longitudinal member or rail against which a bicycle may be leaned, two transverse members which may extend through (1) the front wheel of the bicycle and (2) both the rear wheel and the frame of the bicycle. A locking member closes between both of the transverse members to secure the bicycle between the longitudinal member and the locking member. A rear transverse member connects with the longitudinal member and other longitudinal members of adjacent bicycle racks forming a continuous bank of similar bicycle racks, and further provides a slidable and pivotal mounting for said locking member. These members provide a framework structure wherein a bicycle may be parked and secured against theft or unauthorized removal.

3,786,929

WAREHOUSING SYSTEM USING SLOWDOWN AND STOP BIN INDICATORS

James S. Hathcock, Jr., Houston, Tex., assignor to Conco Inc., Mendota, Ill.

Filed Nov. 1, 1971, Ser. No. 194,713
Int. Cl. B66g 1/36
U.S. Cl. 214—16.4 A 13 Claims



To identify vertical slowdown and stop positions for a stacker crane, each vertical bin is uniquely located by a binary coded slowdown plate and a separate binary coded stop plate. A vertical drive control is responsive to photoelectric sensors, mounted on a crane hoist, as the sensors are driven adjacent

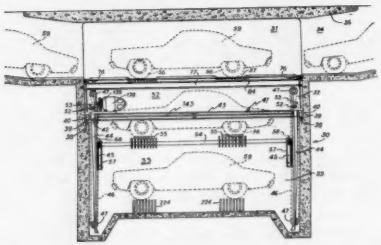
the binary coded plates. To reduce the minimum vertical spacing between bins, the coded plates are interleaved so that the slowdown plate for an adjacent bin is located between each stop plate and slowdown plate for a different bin. Various combinations of detectable elements are carried on each coded plate to provide strobe, high or deposit, and low or retrieve information.

3,786,930

UNDERGROUND AUTOMATIC PARKING SYSTEM FOR VEHICLES

Alejandro Obregon, Horacio 543-403, Mexico City, Mexico

Filed Aug. 9, 1972, Ser. No. 279,268
Claims priority, application Mexico, Sept. 8, 1971, 129985
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 CB **23 Claims**



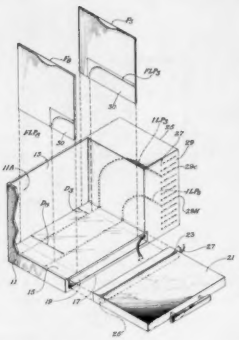
An underground automatic parking system for vehicles, comprising a horizontal tunnel; a rectangular entrance opening on the roof of said tunnel; slidable horizontal doors closing said opening; grids in said doors located at a position suitable to receive the four tires of a vehicle; a carriage movable along the length of said tunnel at an intermediate transit level thereof; the carriage is provided with anchoring means to coact with anchoring blocks provided on the tracks along which said carriage moves, in order to automatically stop the carriage in alignment with a selected parking space; elevator means in said carriage comprising two pairs of comb-like sets of parallel brackets rotatable about respective axes in a position such that the brackets match the position of the four tires of a vehicle, said brackets being such that, when the elevator means are elevated to its uppermost position, said brackets pass between the grids of said doors to support a vehicle located thereon; an upper parking level in said tunnel comprising a plurality of upper parking spaces each being provided with four sets of retractible vehicle supporting brackets, interleavable with the brackets of said elevator means, each set of vehicle supporting brackets being provided with a ratchet mechanism to retain the same in operative position; a lower parking level in said tunnel comprising a plurality of lower parking spaces each being provided with four vehicle supporting cradles, each cradle comprising a grid interleavable with the brackets of said elevator means; said intermediate transit level comprising a lower sub-level to allow the transit of the carriage with its elevator means carrying a vehicle thereon and an upper sub-level to allow the transit of the carriage with its elevator means empty; means for driving said carriage along the length of said tunnel; means for driving said elevator means between the transit level and the upper and lower parking levels and between the transit level and the entrance opening; means for extending and retracting said retractible vehicle supporting brackets of the upper parking level; means for retracting and extending the brackets of said elevator means, when the same are lowered to the lower parking level in order to clear a vehicle parked in a lower parking space; electric detecting means in each parking space to coact with the carriage in order to detect an empty parking space when the carriage is carrying a vehicle thereon; and means for deactivating said detecting means in order to allow the carriage to travel past an empty parking space when it is not desired to park a vehicle therein.

3,786,931

OPTICS INDEX FILING SYSTEM

Ross F. Housholder, 1725 Brooks Dr., Arlington, Tex.

Filed Dec. 7, 1972, Ser. No. 313,146
Int. Cl. A47b *63/00*; **G02b** *5/14*
U.S. Cl. 211—40 **7 Claims**



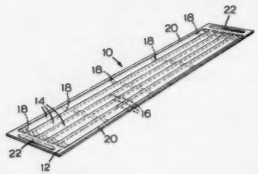
The specification discloses an optics index filing system for allowing records, files, etc. to be filed in a random manner and to be readily identified and retrieved when needed. The system comprises a frame forming a storage zone adapted to hold a plurality of records, files, etc. An optics selector system is employed for identifying the records or files stored. In the preferred embodiment the selector system comprises a plurality of light pipes having ends located in a column or row forming an index observable to the user. The other ends of the light pipes are located at spaced and distinct positions to receive light individually from a movable light emitting selector slit when shifted to different positions. Each record or file folder has a light pipe having one end to be located in alignment with one of said other ends of the index light pipes, when the folder is filed, to receive light from the selector slit when the selector slit is shifted to different positions. The other ends of the light pipes of the record or file folders are located at a position to be observable to the user.

3,786,932

CORE TRAYS

Carl M. Smith, Weston, Ontario, Canada, assignor to Schlegel Company Canada Limited, Oakville, Ontario, Canada

Continuation-in-part of Ser. No. 42,770, June 21, 1970, abandoned. This application Oct. 8, 1971, Ser. No. 187,757
Int. Cl. A47f *7/00*
U.S. Cl. 211—60 A **2 Claims**



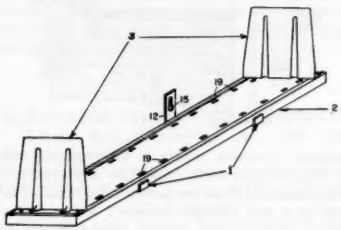
The invention relates to a plastic drill core tray of the type having a plurality of longitudinally extending channels disposed in a side by side relationship which are dished in cross-section to contain a drill core. The effective contained angle of the cross-section at the dished bottom of the channels is greater than 90°. The plastic tray is reinforced with elongated metal reinforcing ribs having a U-shaped cross-section.

The ribs are adhered to adjacent longitudinally extending marginal areas of adjacent channels to provide longitudinally extending reinforcing means, and the contained angle of the cross-section of the tray at the adjacent longitudinally extending areas is less than 90°.

3,786,933
PORTABLE SUSPENDED SHELF

Felipe G. Vianzon, 1436 S. Kearney, Denver, Colo.

Filed Aug. 28, 1972, Ser. No. 266,973
Int. Cl. A47f *5/08*
U.S. Cl. 211—90 **6 Claims**

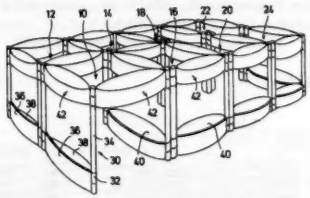


A portable suspended shelf assembly includes a channel-shaped shelf releasably supported by a bracket or a plurality of brackets at spaced intervals along the shelf. Each bracket has a horizontally disposed support portion under the base portion and an upturned inner end portion adapted to fasten to a wall. One depression is formed in the bracket slidably receiving an inner side wall projection of the shelf and another depression is formed in the bracket slidably receiving an outer side wall projection of the shelf. End plates with a pair of depending laterally spaced pins extend downwardly into a plurality of apertures at spaced intervals along the shelf.

3,786,934
CARRIER STRUCTURE PARTICULARLY FOR OFFICE EQUIPMENT ASSEMBLY

Gerard Burgin, 6, rue de la Thur, Kingersheim, France

Filed Mar. 20, 1972, Ser. No. 236,098
Claims priority, application Germany, Mar. 18, 1971, 2113113
Int. Cl. A47f *5/00, 7/00*
U.S. Cl. 211—182 **11 Claims**

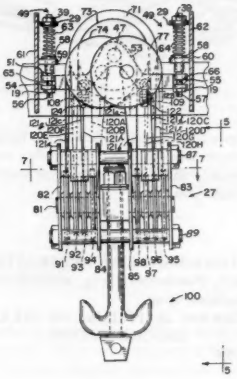


Various items of work place equipment, such as a seat, desk, typewriter top, phone shelf, overhead illuminating structure and the like are supported by one or more vertical carrier columns each formed of an inner throughgoing hollow support post (adapted to receive electric conductors and the like), a plurality of carrier sleeves which surround the hollow support post and to which said items are secured (directly or by a cantilever) and a plurality of spacer sleeves for arbitrarily determining the height position of any carrier sleeve.

3,786,935
OVERHEAD CRANE

Joseph J. Vlazny, Park Forest, Ill., and Malcom M. Coston, Balboa, Calif., assignors to Whiting Corporation, Harvey, Ill.

Filed May 22, 1972, Ser. No. 255,720
Int. Cl. B66c *17/06*
U.S. Cl. 212—11 **15 Claims**



An overhead crane characterized by its redundant or double-safe features. The crane has two separate ropes with one end of each rope attached to the drum and the other end attached to an equalizer. Each rope, intermediate its opposite ends, is reeved over sheaves in the sheave nest and on the load block in such manner that each rope provides at least four active parts (i.e., load-supporting lines) running to the four horizontal quadrants of the load block with respect to the vertical center line therethrough. With this system and arrangement the load block will be supported by two independent sets having at least four active rope parts or lines of support in each set in such a manner that if a rope breaks or fails for any reason, at least one remaining complete set of at least four active parts provided by the undamaged rope will assume full support with little or no appreciable impact load occurring and with only small and acceptable swinging or twisting movement imparted to the lead. Additional redundancy and double-safety is provided by: constructing the crane hook so it has two separate load paths into the load block; having two complete gear trains between the hoist motor and the drum assembly with each being capable of handling the rated load with a normal factor of safety; having safety lugs to catch the drum hubs in case of shaft failure; having safety retainers for all sheaves in the sheave nest and in the load block to sustain the load upon failure of any sheave or its supporting shaft; and, having the equalizer bar boxed or caged in with load supporting members and provided with bumpers at opposite ends.

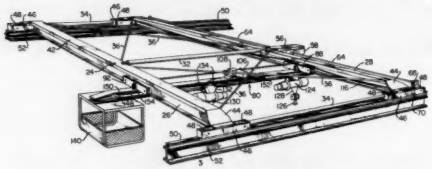
3,786,936
OVERHEAD CRANE APPARATUS

Charles R. Staadt, Aurora, Colo., assignor to Masonry Systems, Inc., Westminster, Colo.

Filed Oct. 26, 1971, Ser. No. 192,026
Int. Cl. B66c *17/06*
U.S. Cl. 212—11 **11 Claims**

An overhead crane adapted for universal movement in a horizontal plane includes a pair of bridge members which span the width of an industrial plant and have guide wheels adapted to be driven along rails running longitudinally along the sides of the plant, a trolley which extends longitudinally of the plant and is mounted on guide wheels which ride along tracks on the

bridge members, the trolley having a hoist stationary relative to the trolley, a hoist movable along the trolley, and an operator's cab at one end of the trolley whereby the operator is provided with a close unobstructed view of the hoists. A sprocket-chain drive is operative to move the trolley along the bridge members to enable the hoists to be positioned close to the sides of the installation site.



3,786,937

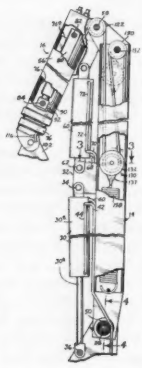
LOAD-HANDLING APPARATUS

Donald M. Faust, Winchester, Oreg., assignor to Cascade Corporation, Portland, Oreg.

Filed Nov. 26, 1971, Ser. No. 202,531

Int. Cl. B66c *23/06*

U.S. Cl. 212—59 **5 Claims**



Load-handling apparatus including a mounting frame, a main boom pivotally connected at one of its ends to the frame, and a jib boom pivotally connected to the opposite end of the main boom. The jib boom includes a telescoping extension section and a motor for extending and retracting the same. A power-operated device is connected to the outer end of the extension section for extension and retraction therewith. Elongated flexible power-supply lines for the power device and the extension motor extend along the jib boom, are trained over a sheave at the pivot connection between the jib and main boom, and then extend along the main boom toward the frame. Line take-up means on the main boom is operable to take up and pay out slack in such lines produced by extension and retraction of the jib boom. The main and jib booms are operated by elongated rams. The main boom ram is pivotally connected at its cylinder end to a midregion of the main boom and at its rod end to the mounting frame in a region spaced laterally of the pivot connection between the main boom and frame. Fluid supply and exhaust lines connect to the cylinder end of the ram adjacent its pivotal connection with the main boom.

3,786,938

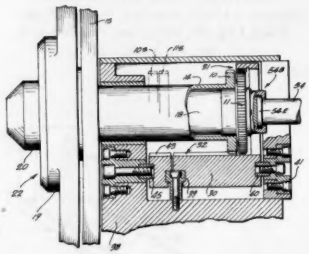
REVERSING DRIVE FOR A TOOL CHANGER

Edward E. Kirkham, Brookfield, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed May 22, 1972, Ser. No. 255,716

Int. Cl. B23q *3/157*

U.S. Cl. 214—1 BD **3 Claims**



The present invention relates to an improved reversing drive for a tool change mechanism. The improved novel features of this reversing drive are particularly disposed to be incorporated in a tool changer equipped with a pair of tool change arms mounted for pivotal movement in opposite direction from a parked position into enclosed gripping engagement with a pair of spaced apart tools. In addition, the described tool changer particularly adapted to receive the present reversing drive has already included separate power means connected to positively maintain the pivotal arms in original clamped engagement as well as effect bodily movement of the clamped arms to interchange the tools. The reversing drive of this invention includes a single unitary rack having inwardly facing opposed upper and lower rack sections laterally offset a sufficient distance to rotatably drive adjacently journalled gears in opposite direction upon rectilinear movement of the unitary rack in one direction. In addition, one of the laterally offset rack sections of the present invention incorporates an axially extending rack section that is relatively positionable to function as a transfer device for simultaneously engaging the synchronized teeth of both oppositely rotated concentric gears to maintain them in preset angular positions during axial movement relative thereto.

3,786,939

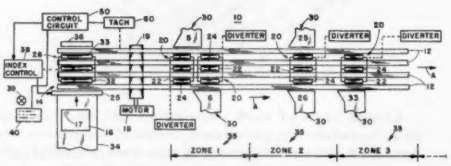
METHOD AND APPARATUS FOR SORTING ARTICLES ON A CONVEYOR UTILIZING A SHIFT REGISTER AND A TIME VARYING CODE CONTROL MECHANISM

James D. Habegger, Middleville; Andrew B. Huttula, Grand Rapids; Daniel L. Fowler, Kentwood, and James T. Schrader, Grand Rapids, all of Mich., assignors to Rapistan, Incorporated, Grand Rapids, Mich.

Filed Oct. 19, 1972, Ser. No. 298,873

Int. Cl. B65g *43/00*

U.S. Cl. 214—11 A **27 Claims**



A sorting conveyor is divided into discrete discharge zones each assigned a unique zone identification code and each in-

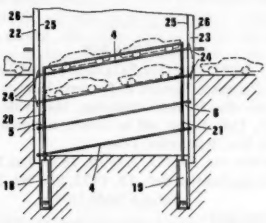
cluding one or more discharge locations having one or two discharge chutes aligned therewith and assigned a chute identification code. Each article inducted onto the conveyor is assigned a digital code a portion of the bits of which correspond to the code assigned to a chute within a zone. The article code is applied to a shift register memory and shifted in synchronism with the conveyor movement to be applied to a zone control circuit during a timer interval corresponding to the entry of the article into the discharge zone. A code generator synchronized with the conveyor movement produces a time varying code repeated for each zone time interval and which is compared with a location code assigned to each discharge location and uniquely identifying the position on a discharge chute within a discharge zone. An article diverter is actuated to discharge an article onto a discharge chute when the zone and chute codes coincide with the article code and the location code assigned to a discharge chute corresponds to the generated time varying code.

3,786,940

GARAGE FOR THE STORAGE OF VEHICLES

Kaspar Klaus, Schlachthofstrasse 46, 894 Memmingen/Bavaria, Germany

Division of Ser. No. 883,903, Dec. 10, 1969, Pat. No. 3,688,922. This application June 21, 1972, Ser. No. 264,842
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 ED **4 Claims**



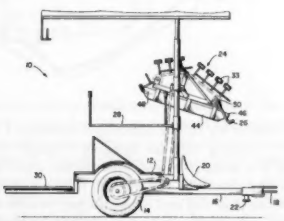
The garage comprises at least two tilting platforms, each capable of accommodating at least two vehicles end-to-end, superposed in spaced relation and linked for tilting in unison to place one end of one platform and the other end of the other platform in communication with fixed run-in and run-off areas of the garage, in one tilted position, and vice versa in the other tilted position. Provision is also made for raising and lowering the interlinked platform structure where there are more than two platforms in a stack.

3,786,941

APPARATUS FOR TOBACCO HARVESTING

Louis E. Dailey, Jr., R.F.D. No. 1 Box 99A, Ahoskie, N.C.

Filed Aug. 15, 1972, Ser. No. 279,539
Int. Cl. B60p *1/36*
U.S. Cl. 214—83.1 **3 Claims**



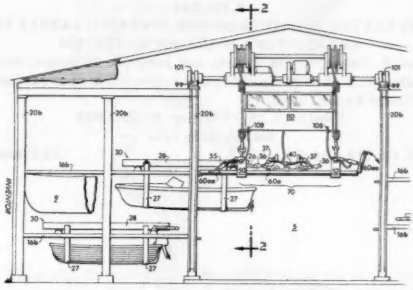
A safety hand positioner and guard for the conveyor of harvested tobacco being passed from the workers known as breakers to the tiers which permits a new and more efficient method of harvesting by passing it rearwardly instead of forwardly of the harvesting vehicle.

3,786,942

DRY SAIL MARINA

Ernest B. Dane, Jr., 57 Tyler Rd., Belmont, Mass.

Filed Feb. 9, 1970, Ser. No. 9,902
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4 A **8 Claims**



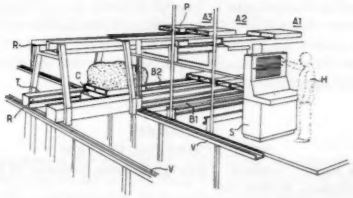
A dry sail marina is disclosed for storing small to moderately sized boats out of the water with means for transferring them automatically between storage points and the water. The marina is contained within a building having a center aisle extending the length thereof and a series of vertically stacked racks bounding each side of the aisle. Boats are stored in sling by boat cars housed in the racks. An overhead traveling crane with a hoist suspended track assembly rides along the center aisle between any storage point and the water side of the marina. The track assembly is adapted to connect with any rack and includes transport means for coupling to individual cars and wheeling them onto and off of the track assembly. To deliver a boat, the track assembly is connected up with the assigned rack and the transport means draws the car with boat in sling onto the track assembly. The loaded track assembly is then transported to the water by the overhead crane whereupon it is lowered and the boat is deposited in the water and released from its car. The crane then returns the boat car to the rack by a reverse procedure.

3,786,943

CENTRALISED CONTROL FOR AN AUTOMATIC SYSTEM OF HANDLING PALLETS

Georges Coppel, Paris, France, assignor to Constructions Mills. K, Saint-Ouen, France

Filed Mar. 28, 1972, Ser. No. 238,771
Claims priority, application France, May 12, 1971, 71.17275
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4 A **9 Claims**



A control system with memory and synoptic panel enabling an operator to prepare the movement of pallets between the passage-ways and the entrances to and exits from a storage installation.

The frame has a main and lateral channels in which slide lugs representing the handling pallets ; movement of the lugs is recorded electrically in the form of signals in the memory ; the starting point and destination signals are progressively converted into commands for the motors of the transfer trolley and the automatic trolley.

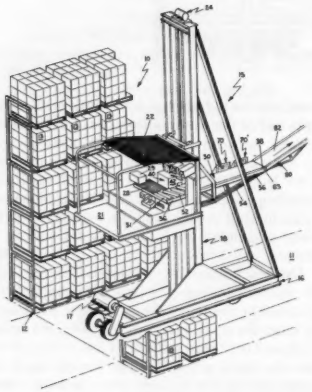
Applicable to all types of storage installations on one or more levels with parallel passage-ways in which storage pallets accumulate.

3,786,944

APPARATUS AND METHOD FOR APPLYING LABELS TO ARTICLES IN A WAREHOUSE SYSTEM

Jack R. Daigle, Grand Rapids, and James D. Habegger, Middleville, both of Mich., assignors to Rapistan, Incorporated, Grand Rapids, Mich.

Filed Sept. 28, 1972, Ser. No. 292,958
Int. Cl. B65g *1/04*
U.S. Cl. 214—16.4 A **12 Claims**



An article retrieval system includes an operator carrying picking vehicle for batch picking of customer orders in a warehouse. The vehicle includes a labeler supplied with a sequence of individual labels for positioning on each article picked. Each label includes article storage location, quantity and destination information and display means are provided for displaying this label information to the operator. A tape includes sorting information recorded thereon for each article to be picked and is synchronized with the sequence of labels placed in the labeler. A tape playback mechanism controls destination coding apparatus such that an article picked by the operator will leave the vehicle with both a label and sorting indicia thereon. The sorting information on the tape is also displayed to the operator to provide a check for synchronization between the tape and the sequence of labels. The articles are then routed via an accumulation conveyor to a sorting area where the sorting indicia is detected to control the diverting of articles to predetermined destination areas.

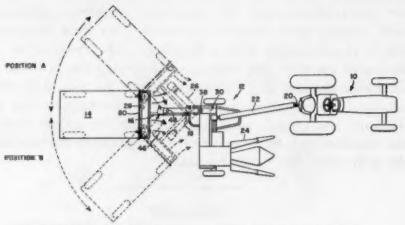
3,786,945

SPOUT CONTROL SYSTEM

Dean Homer Symonds, Davenport, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jan. 15, 1973, Ser. No. 323,984
Int. Cl. B65g *67/22*
U.S. Cl. 214—42 A **9 Claims**

The lateral swing of a discharge spout on a forage harvester is magnetically governed such that the spout is kept in proper coordination with the crop inlet port of a trailing wagon as the harvester is negotiated through turns. A wire loop encircling the wagon, upon excitation by an AC signal, produces a magnetic field which is sensed by a signal coil mounted on the discharge spout and adapted for common movement therewith. The signal coil has an output voltage, the amplitude of which varies as the wagon swings relative to the spout. This



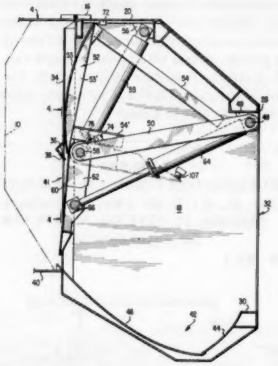
output voltage is compared with the loop excitation signal to denote any phase differential and the resulting voltage signal, after being passed through a dead band generator, drives a bidirectional electrohydraulic unit which swivelly swings the discharge spout into proper coordination with the crop inlet of the wagon.

3,786,946

REFUSE COLLECTION VEHICLES

Charles R. Toppins; Samuel E. Harvey; Harvey W. Liberman, all of Knoxville; Houston Ratledge, Maryville, and Steven C. Voorhees, Oak Ridge, all of Tenn., assignors to Dempster Brothers, Inc., Knoxville, Tenn.

Division of Ser. No. 59,453, July 30, 1970, Pat. No. 3,696,951.
This application Feb. 18, 1972, Ser. No. 227,504
Int. Cl. B65f *3/04*
U.S. Cl. 214—152 **8 Claims**



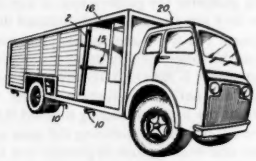
A rear loader for refuse collection vehicles. The rear loader includes a housing with an opening through which refuse is deposited in a hopper. A movable packer plate in the housing moves in opposition to the bottom of the hopper to partially compress the material and subsequently to convey the material through a discharge opening into the body of the vehicle. The packer plate in the housing also cooperates with an ejector plate in the body to further compress the refuse contained within the body.

3,786,947

MOVABLE SHELF APPARATUS

James Pressley Craft, III, College Park, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed June 12, 1972, Ser. No. 261,851
Int. Cl. B60p *1/44*; B65d *9/00*
U.S. Cl. 214—75 R 11 Claims



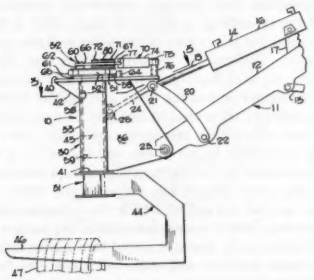
A movable shelf apparatus is described which is capable of being adjustably positioned within a bay of a truck or trailer body for article separation purposes and for supporting, handling, and transporting stacked articles during transit from manufacturing points to sales points. The movable shelf apparatus includes a shelf that is supported within the bay by four roller chains that are recessed within the divider bay walls of the truck or trailer body. The shelf is inclined towards the center of the truck or trailer body to minimize slippage of the articles during transit. The roller chains are driven by a rachet and gear arrangement that is positioned below the compartment floor line of the truck or trailer body so as not to interfere with the interior of the bays and any forklift pallet interface.

3,786,948

MATERIAL HANDLING ATTACHMENT

Norman R. Golden, 718 West Main Street, Carlinville, Ill.

Filed Jan. 17, 1972, Ser. No. 218,128
Int. Cl. B66c *23/00*
U.S. Cl. 214—130 C 6 Claims



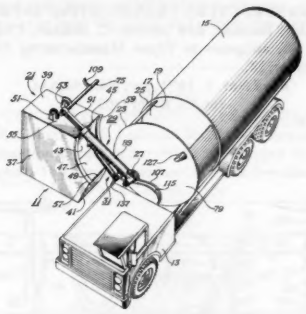
This material handling attachment is adapted to be mounted to the boom of a backhoe. The attachment includes a base assembly for rotatively mounting a shaft assembly having a tiltable axis of rotation. The shaft assembly includes a hook at the lower end providing a transverse loading arm suitable for manipulating bales of coiled wire. The shaft assembly is rotatable through more than 180° of arc by means of a hydraulic actuating assembly providing a compound linkage, which is connected at one end to the shaft assembly and at the other end to the base assembly.

3,786,949

APPARATUS FOR SIDE PICK UP REFUSE COLLECTION

William H. Sutton, 7400 Smithfield Rd., Fort Worth, Tex.

Filed Oct. 16, 1972, Ser. No. 297,687
Int. Cl. B65f *3/02*
U.S. Cl. 214—302 5 Claims



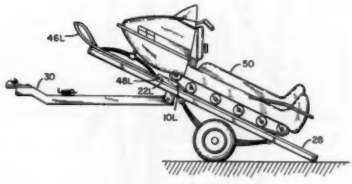
Apparatus for collecting refuse and loading the refuse onto a side-loading, refuse collection vehicle having a bed and a loading compartment with a top opening aperture therein, characterized by: a trash container that includes a sloping front wall for dumping the trash from the container when it is inverted, doors, loading hooks, and a pair of arcuate track engaging means for maintaining the container in place when it is inverted onto the bed of the vehicle and preventing escape of trash; a pair of arcuate tracks mounted on the vehicle; a base connected to the front of the bed of the vehicle so as to accommodate lateral motion of a pick up arm; and an extensible and retractable L-shaped cantilever pick up arm for being moved outwardly to pick up, invert, and lower the trash container by its hooks responsive to operation of the controls by only a driver of the vehicle, without requiring rolling of the container into position by a helper. Also disclosed are preferred structural embodiments, including safety catches and the like.

3,786,950

APPARATUS FOR LOADING SNOWMOBILES ON TRAILERS

Andrew S. Zemien, 6311 Jefferson St., Fridley, Minn.

Filed Dec. 29, 1972, Ser. No. 319,519
Int. Cl. B60p *3/00*
U.S. Cl. 214—506 4 Claims



An attachment for facilitating the loading of a snowmobile on a tilting type trailer is described. The attachment, in its simplest form, comprising a pair of ramp-like members, each ramp terminating in a sheer dropoff, and having one side defining a guide and adapted to be removably-secured to the trailer bed. As the snowmobile is driven onto the trailer, its skis engage the guide attachment and are steered up the ramps until the trailing edges of the skis fall off the sheer dropoff

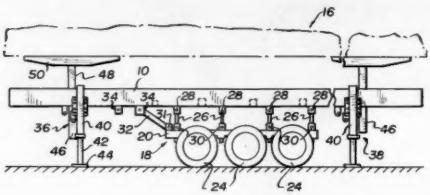
back onto the trailer bed, thus giving a positive indication that the snowmobile is in a desired position on the trailer bed. The sheer dropoff of the ramps also provide a restraining surface in holding the snowmobile in a desired location on the trailer and prevent it from sliding back down the trailer's inclined bed.

3,786,951

MODULAR STRUCTURE TRANSPORTING APPARATUS

Paul H. Ruff, Decatur, and Jerome C. Schnur, Champaign, both of Ill., assignors to Tryco Manufacturing Company, Inc., Decatur, Ill.

Filed Nov. 1, 1971, Ser. No. 194,634
Int. Cl. B60p *1/02*
U.S. Cl. 214—512 **3 Claims**



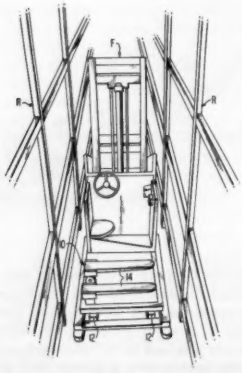
A trailer for transporting modular building structures from a point of assembly or storage to a point of permanent installation. The same includes an elongated frame having sufficient strength to receive and support a modular building structure and a wheeled carriage secured to the underside of the frame for vertical movement relative to the frame so that the height of the frame above the terrain over which it may travel may be varied. The frame also mounts a plurality of pairs of jacks with one jack on each pair adapted to engage the underlying terrain to raise or level the frame relative thereto and the other jack in the pair adapted to move an element upwardly to engage the underside of a modular building structure. Each pair of jacks is pivotally mounted of the frame for movement between the above operative position and traveling position and the arrangement is such that the weight of one jack generally counterbalances the other of the pair so that the same may be easily manipulated.

3,786,952

BI-DIRECTIONAL FORK APPARATUS

Richard E. Nearman, Rt. 3 Box 90, Mount Airy, Md.

Filed Nov. 1, 1972, Ser. No. 302,643
Int. Cl. B66f *9/14*
U.S. Cl. 214—731 **16 Claims**



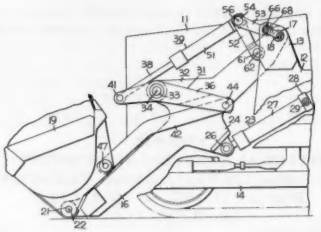
Bi-directional, side loading fork apparatus adapted to be mounted on a vertically movable mounting structure or base mounted on a lift vehicle of any suitable construction. The lift vehicle is adapted to be positioned and operated in an aisle between two storage racks where pallets are to be stored. A supporting frame is mounted on the base and is laterally movable relative thereto, the frame being of a width that is only slightly less than that of the aisle between the storage racks. A shuttle platform or head is mounted on the supporting frame and is laterally movable relative thereto between the storage racks. A pair of forks are rotatably mounted on the shuttle platform for rotation about a substantially vertical axis so that the direction of the forks can be reversed. Means are provided on the shuttle platform for guiding one of the forks over the other fork as they are simultaneously rotated during reversal of their positions. The forks and shuttle platform are so interconnected that the forks are rotated to accomplish reversal as the shuttle platform is moved laterally between the storage racks. In this manner, the direction of the forks can be reversed without the forks extending beyond the width of the supporting frame, thereby minimizing the aisle space required for the subject side-loading fork apparatus and allowing 100% selectivity of pallets in any given storage rack aisle without the necessity of reversing the direction of the lift vehicle.

3,786,953

LOADER LINKAGE

Robert L. Crum, and Ishwarlal P. Patel, both of Springfield, Ill., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 16, 1972, Ser. No. 307,054
Int. Cl. E02f *3/00*
U.S. Cl. 214—776 **10 Claims**



The bucket control linkage of a tractor loader includes a vertically disposed lever pivotally connected intermediate its upper and lower ends to a boom. A dump link is interconnected between the lower end of the lever and the upper rear of the bucket. The bucket control linkage also includes a bucket operating jack having its front rod end pivotally connected to the upper end of the lever and its rear cylinder end pivotally connected to a special linkage. The special linkage includes a pair of pivotally interconnected links, one of which is pivotally connected to the boom and the other of which is pivotally connected to the tractor frame at a point spaced forwardly of the pivot connection between the boom and the frame. The special linkage to which the cylinder end of the bucket operating jack is connected, causes the bucket to automatically retract as the boom is raised through an initial angle toward its level position and then will cause the bucket to pivot forwardly relative to the boom to maintain the bucket in a proper material retaining altitude in relation to the ground. The various components of the bucket operating linkage are in line with the longitudinal vertical plane of the boom for ideal component stress distribution. The bucket is retracted by introduction of hydraulic fluid to the cylinder end of the dumping jack whereby the greatest possible breakout force is achieved by the jack. The rod end of the hydraulic jack is pressurized to dump the bucket thus giving the shortest possible dumping time. The connections between the bucket operating linkage and the frame of the tractor are relatively low thereby affording good operator visibility and desirable loader frame stress distribution.

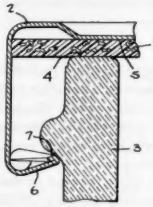
ERRATA

For Classes 214—16.40 A and 214—16.1 CB see: Patents Nos. 3,786,929 and 3,786,930

3,786,954
CLOSURE CAP LINER

Robert W. Shull, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Pa.

Filed Oct. 18, 1971, Ser. No. 189,901
Int. Cl. B65d *53/04*
U.S. Cl. 215—40 **5 Claims**

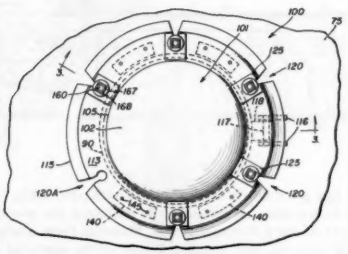


An improved cap liner is disclosed for use with a closure cap in sealing a container. The liner is cut from a foamed polyethylene sheet material. It provides an extremely tight seal for products such as fine powdered products where leakage has been experienced with prior liners. The foamed liner material has improved dynamic cushioning properties so that a tight seal is maintained at all times including handling and shipping operations of the sealed package. One embodiment of the closure is a laminate of the foamed sheet material and a thin air impervious film such as a saran resin film.

3,786,955
MANWAY COVER FOR TANK CARS

Erling Mowatt-Larssen, Warren, Ohio, assignor to General American Transportation Corporation, Chicago, Ill.

Filed Aug. 30, 1971, Ser. No. 176,000
Int. Cl. B65d *41/00*
U.S. Cl. 220—55 E **6 Claims**

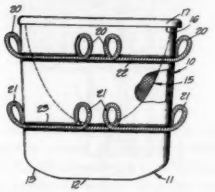


A manway cover assembly for a pressurized railway tank car comprises an integrally constructed cover plate having a generally cylindrical side wall portion and a sealing flange extending outwardly from the side wall portion substantially normal thereto and a stiffening flange sloping downwardly and outwardly from the sealing flange, a gasket held in place on the sealing flange by four retaining plates for sealing engagement with the manway rim, six spaced-apart notches formed in the periphery of the cover plate, one of the notches having a relatively narrow neck portion and a relatively wide base portion, six eye-bolt and nut assemblies pivotally mounted on the manway for movement between locking positions respectively disposed in the notches for holding the cover plate in sealing relationship with the manway and releasing positions disposed out of the notches, a sleeve surrounding the shank of the bolt corresponding to the one notch and constructed and arranged to be accommodated only in the wide base portion of the one notch when the cover plate is closed, whereby the one bolt cannot be pivoted from its locking position until a cover plate is loosened and lifted a predetermined distance sufficient to clear the sleeve from the notch and relieve the pressure in the tank.

3,786,956
CONTAINER FOR EXPLOSIVE CHARGE

Patrick M. Tabor, 101 S. LaSenda Dr., South Laguna, Calif.

Continuation-in-part of Ser. No. 27,626, April 13, 1970, abandoned. This application June 3, 1970, Ser. No. 43,110
Int. Cl. B65d *25/14*
U.S. Cl. 220—63 R **7 Claims**

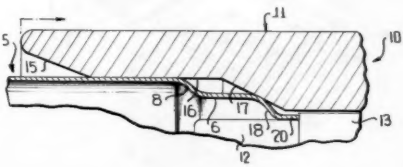


There is disclosed herein a container within which explosives, such as bombs, can be placed and transported for disposal. An exemplary container may be considered as essentially an elastic container, and is substantially cylindrical with an arcuate bottom and formed from a number of laminations of suitable material, such as fiberglass. A support member is provided in the container for holding the explosive charge from intimate contact with the container. The support member may be in the form of a net suspended in the container, foam material within the container, or the like. The structure of the container is such that if the bomb explodes the container delaminates rather than breaking apart in the form of flying fragments.

3,786,957
DOUBLE STAGE NECKING

John T. Hilgenbrink, Oak Lawn, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Mar. 22, 1971, Ser. No. 126,681
Int. Cl. B65d *7/42*
U.S. Cl. 220—83 **2 Claims**



This disclosure relates to the necking-in of can bodies for the purpose of applying smaller diameter or special ends thereon. Previously experienced extreme difficulties in properly necking-in can bodies have been eliminated by first necking-in a larger than normal end portion of a can body to an intermediate diameter and then utilizing tooling for performing the desired necking in operation to further neck-in the extreme end portion only of the previously necked-in longer end portion.

3,786,958

DEVICE FOR SUPPORTING AND DELIVERING CONTAINERS IN A CONTROLLED FORM

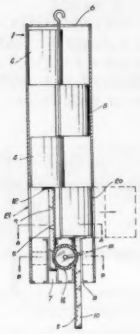
Tita Zuccaro de Morgan, Guemes 1053, San Salvador de Jujuy, Argentina

Filed Apr. 3, 1972, Ser. No. 240,469

Claims priority, application Argentina, May 10, 1971, 235461

Int. Cl. B65g *59/06*; A47f *1/08*

U.S. Cl. 221—67 2 Claims



The present invention relates to a device for supporting and delivering containers in a controlled form. The containers are stacked in the device alternately in adjacent overlapping columns. A ratchet and gear wheel arrangement control a platform under each column to facilitate withdrawal through an opening in said device of one container at a time.

3,786,959

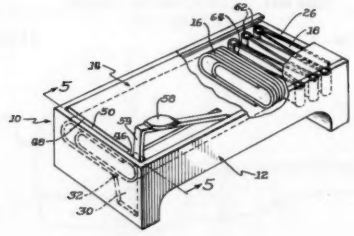
PAPER CLIP DISPENSER

Kenneth W. Greb, and Daniel W. Greb, both of 18 Stanford Dr., Glenview, Ill.

Filed Apr. 5, 1972, Ser. No. 241,224

Int. Cl. B65h *3/36*

U.S. Cl. 221—261 5 Claims



A paper clip dispenser includes a housing having a base member and a cover member which cooperate to confine a plurality of paper clips in a side-by-side relationship and includes a spring for biasing the clips to a dispensing position. The cover member has an integral manually operable member for pivoting one end of a clip about an abutment and into a slot in the base member thereby projecting the other end of the clip through an exit aperture. The projected clip is ready to be lifted from the dispenser.

3,786,960

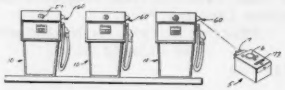
TRANSMITTER-OPERATED FUEL-DISPENSING SYSTEM

Robert B. Young, Buena Park, Calif., assignor to Pan Nova, Inc., Santa Fe Springs, Calif.

Filed Nov. 10, 1971, Ser. No. 197,244

Int. Cl. G07f *13/00*

U.S. Cl. 222—2 4 Claims



A gasoline-dispensing system includes a portable transmitting unit for each service attendant and a plurality of transmitter-operated dispensing units. Each transmitting unit is connectable to any one of the dispensing units and has manually operable switching means cooperating with the interconnected dispensing unit for generating credit signals which are accepted and registered in the dispensing unit. A meter in each transmitting unit accumulates and indicates a running total of the number of accepted credits attributable to that transmitting unit. After the desired number of credits are accepted in the dispensing unit, the transmitting unit is removable to be used elsewhere while a customer serves himself. Each dispensing unit includes valves and means for closing them when the value of gasoline dispensed equals the number of credits accepted. A coin-return mechanism is provided for returning change to the customer as necessary.

3,786,961

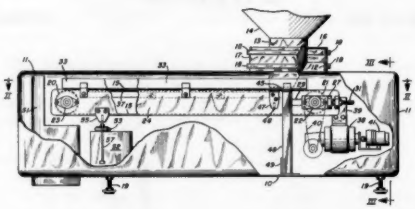
SET RATE GRAVIMETRIC FEEDER

Eugene A. Wahl, 460 Ridgewood Ave., Glen Ridge; Cornelius Debonte, Jr., 1 Birch Rd., Little Falls, and Ralph J. Winters, 138 Crestview Ave., Nutley, all of N.J.

Filed Oct. 5, 1972, Ser. No. 295,113

Int. Cl. G01g *11/12*

U.S. Cl. 222—55 8 Claims



A set rate gravimetric feeder for use with particulate materials and comprising an endless belt mounted for pivotal displacement about a horizontal axis. Material from a hopper is delivered onto the belt and the weight of the material on the belt is sensed by a transducer which effects operation of a control system for automatically adjusting the belt speed to maintain a discharge of the material from an end of the belt at a pre-set rate.

3,786,962

MOLTEN METAL DOSING SYSTEM

Ronald C. VanLinder, Watervliet, Mich., assignor to Kalamazoo Manufacturing Company, Kalamazoo, Mich.

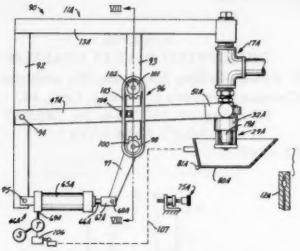
Filed Nov. 15, 1971, Ser. No. 198,686

Int. Cl. B22d *37/00*

U.S. Cl. 222—56 9 Claims

Apparatus for dispensing a measured and adjustable amount of molten lead into a mold and incorporating a self-

cleaning valve for controlling the amount of lead dispensed. The valve mechanism includes a tube supplied with molten lead, the lower end thereof being disposed above a trough pivotable for pouring lead into a mold. A substantially cylindrical valve element is slidably receiving in the lower end of the tube with a clearance through which the molten lead flows in the open condition of the valve, such flow washing the valve element and tube to maintain same clean. The valve element has a substantially conical inner end to assist cleaning the



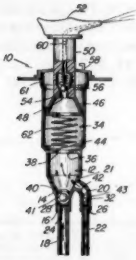
inner wall of the tube upon sliding therein and further has a radially extending, tapered sealing portion adapted to close the end of the tube for preventing lead flow therefrom. Means connect the valve element to a slider telescoped on the tube. A pivoted lever connects between a motive power source and gimbal means connected to the slider, the lever being pivotally supported for transferring motion of the motive power source to the slider and valve element with a mechanical advantage. Means coact with the lever for adjustably limiting opening motion of the valve.

3,786,963

APPARATUS FOR DISPENSING MIXED COMPONENTS

Gottfried Metzler, III, Lancaster, Pa., assignor to The Mennen Company, Morristown, N.J.

Filed Nov. 4, 1971, Ser. No. 195,714
Int. Cl. B67d *5/50*
U.S. Cl. 222—136 **2 Claims**



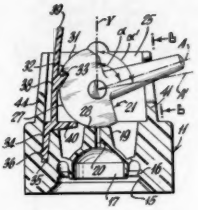
An apparatus for dispensing mixed components including a mixing chamber, first means for directing a first liquid component into the mixing chamber, second means for directing a second liquid component into the mixing chamber, valve means for normally preventing the liquid components from entering the mixing chamber from the first and second component directing means, and pump means for opening the valve means to withdraw the liquid components into the mixing chamber for mixing and dispensing of the resulting product from the mixing chamber.

3,786,964

SAFETY MECHANISM FOR A LIQUID-DISPENSING CONTAINER

William James Landen, Cheshire, Conn., assignor to Eyelet Speciality Company, Wallingford, Conn.

Filed Sept. 15, 1972, Ser. No. 289,245
Int. Cl. B67b *5/00*
U.S. Cl. 222—153 **12 Claims**



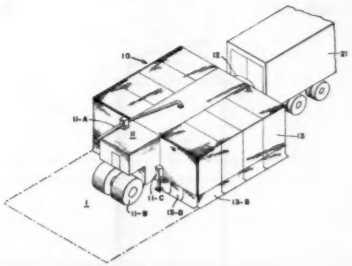
The invention contemplates application to liquid-dispensing closures of the type in which a dispensing nozzle is rotatable between a first or liquid-dispensing position and a second or container-closing position. Safety features are provided by latch or dogging elements which automatically set a dogged condition of the nozzle at the second or container-closing position, and a deliberate and totally separate manual actuation of the latch mechanism is required to disenage the dogged condition, in order to permit nozzle actuation to the first or liquid-dispensing position.

3,786,965

FLUID DISPENSER MANIPULATION

James R. James, Louisville, and Kay E. Eliason, Fort Madison, both of Iowa, assignors to Atlantic Richfield Company, New York, N.Y.

Filed Nov. 10, 1971, Ser. No. 197,219
Int. Cl. A01c *15/00*
U.S. Cl. 222—176 **19 Claims**



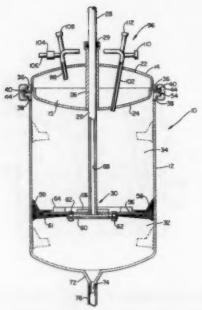
Described is apparatus for dispensing fluid materials such as urethane foams onto terrestrial substrates, in a precisely controlled manner with high thickness uniformity and including such sub-components as chain driven reciprocated carrier means, coupling means and accessories, and supplemental conduit suspension means.

3,786,966

APPARATUS FOR DISPENSING FLOWABLE HIGH-DENSITY MATERIAL

Gage B. Behunin, Arvada; Eugene A. Cole, Denver, and Charles R. Staadt, Aurora, all of Colo., assignors to Masonry Systems, Inc., Westminster, Colo.

Filed Oct. 26, 1971, Ser. No. 192,016
Int. Cl. E04g 21/04
U.S. Cl. 222—387 17 Claims



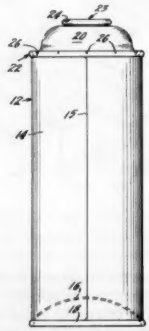
A pressurized pot for dispensing mortar includes a cylindrical tank having a piston with a hollow piston rod mounted for reciprocal movement therein. The piston divides the tank into a compression chamber and a mortar supply chamber, the mortar supply chamber having an outlet connected to an adjustable trowel through which mortar may pass. A removable hermetically sealable cap for the tank has a compressed air reserve chamber and a pressure line connecting the reserve chamber to the compression chamber through a pressure regulator valve. The hollow piston rod fluidically connects the mortar supply chamber to the atmosphere and includes a rubber valve which seals or closes the opening in the piston rod when the piston engages the mortar so that mortar cannot pass therethrough but allows air entrapped in the mortar supply chamber to escape until the valve closes.

3,786,967

PRESSURE RELIEF SYSTEM FOR AN AEROSOL CONTAINER

James Donald Giocomo, Schaumburg, and Harry Anthony Grosso, Wheeling, both of Ill., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 75,470, Sept. 25, 1970, abandoned.
This application June 8, 1972, Ser. No. 261,126
Int. Cl. B65d 83/00
U.S. Cl. 222—397 5 Claims



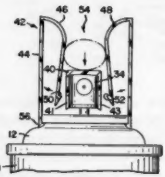
A metal container that is adapted to hold a pressurized product for dispensing through a valve mounted on the container. The container has a safety venting system therein, whereby the product may be vented from a filled pressurized container through the system when an increase in internal pressure threatens to blow an end off the container. The venting system comprises a plurality of scores formed in the upper seam where the container body is jointed to the dome closure of the container. When the internal pressure of a filled container increases sufficiently the periphery of the dome buckles outwardly causing the residual of the scores to fracture and thus produce a plurality of vents to permit the highly pressurized contents of the sealed container to safely escape and prevent end blow off.

3,786,968

CHILDPROOF SAFETY ADAPTOR

Ronald F. Ewald, Rolling Meadows, Ill., assignor to Seaquist Valve Company, Division of Pittway, Cary, Ill.

Filed Aug. 18, 1972, Ser. No. 281,917
Int. Cl. B65d 83/14
U.S. Cl. 22—402.11 9 Claims



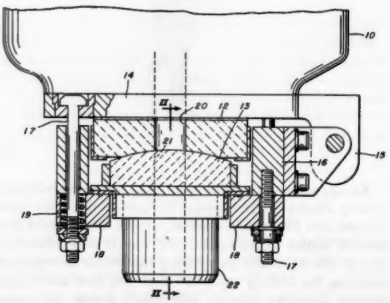
A childproof safety adaptor for an aerosol dispenser comprising an adaptor having a pair of spaced finger guides attached thereto by resilient interconnecting means, each finger guide includes a locking ledge arranged to operatively engage the button actuator to prevent actuaton of the dispenser when in the "locked" position. The spaced separation of the finger guides is such that a finger inserted therebetween moves the finger guides outward relative to each other moving the locking ledges out of operative engagement with the button actuator thereby permitting vertical movement of the button actuator for actuation and wherein upon removal of the finger from between the finger guides, the locking ledges automatically return to the "locked" position.

3,786,969

SLIDING-GATE CLOSURE CONSTRUCTION FOR BOTTOM-POUR VESSELS

Calvin E. Kelly, Franklin Twp., Westmoreland County, Pa., assignor to United States Steel Corporation

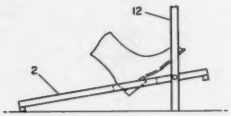
Filed Apr. 17, 1972, Ser. No. 244,518
Int. Cl. B65d 47/00
U.S. Cl. 222—561 4 Claims



A slidable gate construction for use as a closure on a bottom-pour vessel, such as a ladle or tundish used for pouring

liquid metal. The novel feature is that the upper face of the gate is convex when viewed in cross section. The underface of the top plate has a mating concave face.

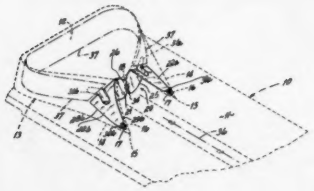
3,786,970
BOOT AND SHOE PULLER
Lemuel Claude Dixon, 6252 S. Pennsylvania, Littleton, Colo.
Filed Feb. 15, 1973, Ser. No. 332,563
Int. Cl. A42c *1/04*
U.S. Cl. 223—15 **3 Claims**



An improved and durable device allowing the quick and easy removal of boots or of high-top shoes, is herein disclosed.

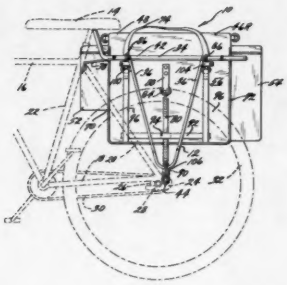
The current invention incorporates, with the use of an elongated foot-board and integral hand-grip, an improved means of stabilizing the device and utilizing maximum leverage to facilitate the shoe or boot removal.

3,786,971
SKIRT COLLAR SUPPORT
Robert I. Lojinger, 6405 Shadyglen, Cincinnati, Ohio
Filed Feb. 5, 1973, Ser. No. 329,756
Int. Cl. D06c *15/00*
U.S. Cl. 223—83 **7 Claims**



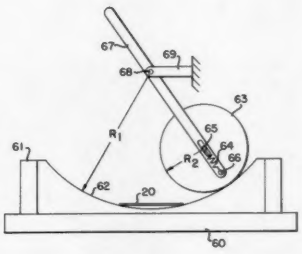
A shirt collar support particularly adapted for use with button-down type collars. The collar support includes a wing section extending outwardly from each end of a center section, a symmetry axis that extends through the center section dividing the collar support into mirror image right and left hand halves. Each wing section is folded in the same direction relative to the center section on a fold line disposed at an angle of about 45° relative to the symmetry axis. In use, the collar support's center section is wrapped around the front of the shirt's collar band, same being held positively in location by engaging the shirt's collar button with a collar button slot formed in the center section. The collar support is positioned relative to the shirt's collar band so that each of the wing sections extends outwardly from the shirt's collar band about the fold lines, thereby underlying the points of the shirt's collar and lifting the collar's points upwardly into collar configuration away from the body of the shirt.

3,786,972
COMBINATION PANNIER BAG, VALISE AND BACK PACK
Hartley R. Alley, 970 Gillaspie Dr., Boulder, Colo.
Filed Dec. 27, 1971, Ser. No. 212,060
Int. Cl. B62j *9/00*
U.S. Cl. 224—31 **3 Claims**



This invention relates to a pair of stiff-backed compartmentalized fabric bags having marginal fasteners for use in releasably connecting the bags together in back-to-back relation so as to form a unitary valise and, in addition, a three-hook harness subassembly on the back of each bag by means of which they can either be hung on opposite sides of a rear fender luggage carrier of a bicycle to form pannier bags or, alternatively, fastened in stacked superimposed relation on a pack frame to form a back pack.

3,786,973
METHOD AND APPARATUS FOR BREAKING SEMICONDUCTOR WAFERS
Dale R. Bussman, Dayton; Frederick K. Bell, Centerville, and David E. Filsinger, Dayton, all of Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed Mar. 28, 1972, Ser. No. 238,825
Int. Cl. B26f *3/00*
U.S. Cl. 225—2 **8 Claims**



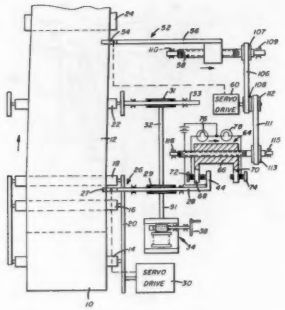
The semiconductor wafers, containing a plurality of electrical circuits, are scribed along critical lines so as to provide weakened portions for ease of breaking the wafers along such lines. The wafer is placed between two cylindrical surfaces of prescribed radii, one larger than the other, and a predetermined load is impressed to deform the wafer and to accurately control the stresses throughout the wafer for breaking the wafer into dice containing individual circuits.

3,786,974

WEB EDGE GUIDE SYSTEM

Martin W. Kron, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 19, 1972, Ser. No. 273,236
Int. Cl. B65h 25/26
U.S. Cl. 226—19 14 Claims



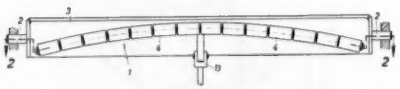
Apparatus for limiting the maximum lateral web shift initiated by a web guiding system to a predetermined safe amount. A first web edge sensor adjacent the supply roll senses deviations from a normal web edge position and generates a correction signal which causes a servo-drive system to axially move the web supply roll in a direction to return the web to its normal position. A second web edge sensor longitudinally spaced along the web from the first sensor senses the web edge, and in response thereto positions stop members which limit corrective lateral shift of the first edge sensor to a predetermined safe amount.

3,786,975

APPARATUS FOR BROAD-DRAWING SHEET MATERIALS

Willia Heymanns, Hemmerden Ub. Neuss, Germany, assignor to Jagenberg Werke AG, Dusseldorf, Germany

Filed July 7, 1972, Ser. No. 269,695
Claims priority, application Germany, Aug. 5, 1971, P 21 39 159.3
Int. Cl. B65h 17/20
U.S. Cl. 226—194 5 Claims



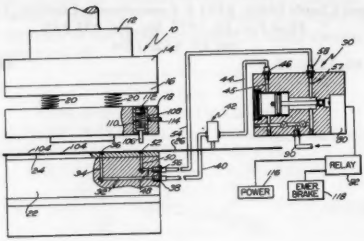
In a broad-drawing roll for moving webs of paper or the like, including a plurality of individual roll sections defining an arcuate curve to spread the web, the improvement which comprises a plurality of supporting bearings provided between the individual roll sections, said bearings being adjustable selectively and independently of one another and thereby determining the degree of curvature defined by said roll sections. Each roll section is mounted in freely rotatable fashion on its own shaft of substantially the same length as the section. Bearings, comprising two halves meeting along a line diametrically of the shaft, occupy substantially the full small space between adjacent roll sections.

3,786,976

SENSOR SYSTEM FOR AUTOMATIC TOOLING

Patrick J. Murphy, II, 96 North St., Middleboro, Mass.

Filed June 21, 1972, Ser. No. 264,835
Int. Cl. B65h 25/32, 25/08; B26d 7/24
U.S. Cl. 226—48 15 Claims



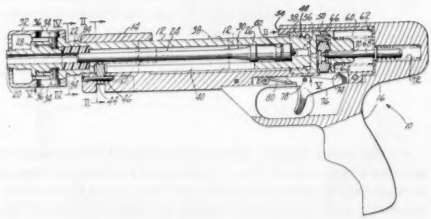
A device is disclosed for detecting a variation in position from normal of a work material as located in a work fabricating machine. The device includes a sensor system that communicates with a work station in said machine and includes a sensing unit through which a fluid under pressure is directed, an equilibrium condition of said sensing unit being established in accordance with the flow of fluid therethrough when the work material is in the normal position thereof at the work station. Should the work material be located out of the normal position at the work station, the equilibrium condition of the sensing unit is disturbed and the sensing unit is operative to discontinue the operation of the machine.

3,786,977

EXPLOSIVE FASTENER DRIVING TOOL

Thomas P. Shamaly, Shelton, Conn., assignor to USM Corporation, Boston, Mass.

Filed May 23, 1972, Ser. No. 256,085
Int. Cl. B25c 1/14
U.S. Cl. 227—8 10 Claims

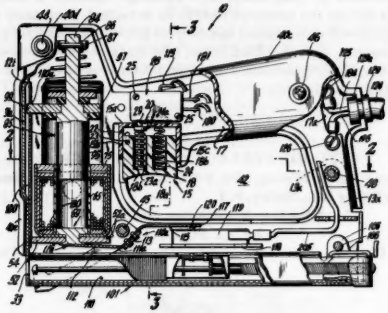


An explosive fastener driving tool of the "push to fire" type comprises a barrel which is axially slidable and rotatable in a receiver to and from breech closed and locked position. The receiver pivotally supports a safety pawl slidable in a longitudinal slot in the barrel to return a driving ram therein to its initial operating position. Additionally the pawl prevents tool cocking unless the barrel is locked in operating position. The pawl is removed from the barrel by breech locking movement to allow the ram to impact a buffer in the event of overdrive thus avoiding damage to the pawl.

3,786,978
ELECTROMAGNETIC STAPLER

George F. Manganaro, Lake Hiawatha, N.J., assignor to Electro-Matic Staplers, Inc., Woodcliff Lake, N.J.

Filed June 5, 1972, Ser. No. 259,398
Int. Cl. B25c 1/06
U.S. Cl. 227—8 24 Claims

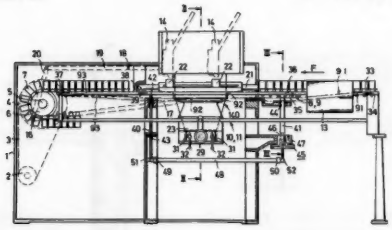


This electro-magnetic stapler is hand held and has a circuit including a trigger switch, which when actuated, energizes an electro-magnetic load coil to operate the stapler. When the trigger is held in an actuated condition for sufficient time the operation of the stapler is repeated. A safety switch controlled by work engaging means on the stapler, prevents operation of the stapler unless said work engaging means contacts the work piece. The staple driving blade is at the front end of the stapler to facilitate locating the stapler relative to the place where the stapling is to be done. The trigger switch assembly permits a smooth operation. The assembly of the stapler permits a pair of split plastic covers to be removed without effecting the innards of the stapler. The plunger movement is shock absorbed at opposite ends of its movement. The circuit parts and components are housed in the stapler and mounted on a non-conductive plate disposed in the handle portion of the stapler.

3,786,979
STITCHING MACHINE FOR A STACK OF SHEETS

Hans Muller, Zofingen, Switzerland, assignor to Grapha Maschinenfabrik Hans Muller AG, Zofingen, Switzerland

Filed Mar. 2, 1972, Ser. No. 231,252
Claims priority, application Switzerland, Apr. 8, 1971, 5210/71
Int. Cl. B27f 7/08
U.S. Cl. 227—44 10 Claims

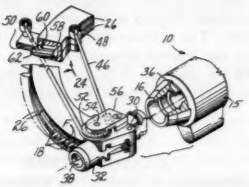


A stitching machine for stitching a folded stack of sheets along a fold line by a stitching head cooperating with a clinching anvil, has two conveyors located on opposite sides of the clinching anvil for transporting and carrying the angularly spread stack portions, while the inside of the fold line slides on the clinching anvil whose position is adjusted to the thickness of the stack. Manual means are provided for raising and lowering the conveyors with the stacks also in accordance with the thickness of the transported stacks and with the adjusted position of the clinching anvil.

3,786,980
MECHANISM FOR FEEDING WASHER-CARRYING FASTENERS

La Roy B. Passer, Seymour, Conn., assignor to USM Corporation, Boston, Mass.

Filed July 14, 1972, Ser. No. 271,680
Int. Cl. B25c 1/14
U.S. Cl. 227—120 6 Claims

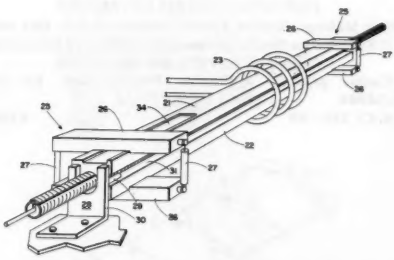


A fastener driving tool is provided at its muzzle end with a circular magazine slidably carrying washer-bearing fasteners, and a spring-urged follower in the magazine is arranged to position the fasteners successively in driving position in the tool. The magazine is preferably mountable for rotation about the driving axis to enable the fasteners to be conveniently supplied regardless of restricted space in which to operate the tool. The magazine preferably is detachably mountable to enable a similar feeding device to supply a different size of washer-carrying fastener.

3,786,981
CONTINUOUS SOLDERING APPARATUS

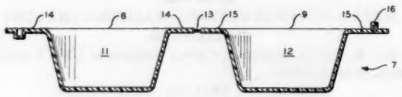
Dan Bryan Davis, Ile Perrot, Quebec, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Feb. 25, 1972, Ser. No. 229,321
Int. Cl. B23k 1/00
U.S. Cl. 228—4 1 Claim



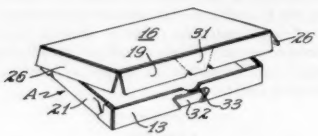
Soldering apparatus, and method, for soldering a butt strap over a butt joint of a tube, particularly a corrugated tube, as used for the outer conductor of a coaxial cable. The soldering member is in two opposed parts acting on the strap and tube to maintain the strap in correct alignment and in intimate contact while soldering, the soldering member floating and sliding on the tube.

3,786,982
THERMOFORMED SNAP CLOSURES
James L. Rakes, and Wayne E. Cooper, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Nov. 17, 1971, Ser. No. 199,422
Int. Cl. B65d 1/26; A44b 17/00
U.S. Cl. 229—2.5 8 Claims



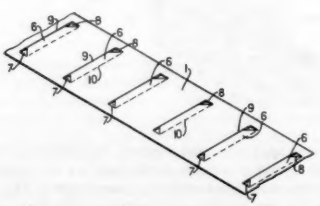
An at least substantially cylindrical columnar projection thermoformed in a first sheet of a thermoformable polymeric material and an at least substantially cylindrical columnar depression thermoformed in a second sheet are employed as a snap fastener. The exterior dimensions of the columnar projection and the interior dimensions of the columnar depression permit the insertion of the columnar depression with significant frictional engagement therebetween.

3,786,983
CARTON OPENER
Russell J. Hennessey, St. Paul, Minn., assignor to Hoerner Waldorf Corporation, Ramsey, Minn.
Filed Mar. 1, 1971, Ser. No. 119,622
Int. Cl. B65d 5/54
U.S. Cl. 229—51 WB 2 Claims



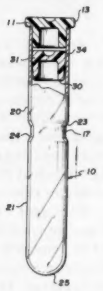
Two layers of paperboard are sealed together. An intermediate area of one lyaer is embossed outwardly away from the other so that the other layer is out of contact with the one layer when the layers are sealed. This leaves the embossed area free of adhesion to the other layer so that it may be grasped for removal.

3,786,984
CONTINUOUS STRIP ENVELOPES
Pierre Malenge, Raches, France, assignor to S.A. Dite Societe D'Exploitation Des Establissements Malenge, Raches, France
Filed Sept. 23, 1971, Ser. No. 182,990
Claims priority, application France, Sept. 23, 1970, 70.34944
Int. Cl. B65d 27/10
U.S. Cl. 229—69 8 Claims



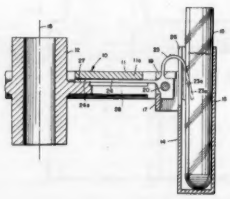
A continuous strip of successive detachable envelopes in the form of continuous stationery for use in printing mechanism of calculators or computers is produced from superimposed punched webs one of which has folded edge portions forming tabs which are coated with adhesive and bonded to an opposed web, the webs being also bonded along a transverse line between the terminal ends of the side tabs to form successive envelope elements having internal dimensions substantially equal to the external dimensions. In a preferred construction a tab formed in the opposed web is bonded to a transverse adhesive line applied to the first web to form the bottom of the envelope and said first web is shaped so that on detachment of each successive envelope element a tuck-in flap is left for the envelope next to be detached. Preferably the opposed web is extended laterally to provide a marginal portion bearing sprocket feed holes, said marginal portions being capable of being detached after detachment of successive envelopes from the strip.

3,786,985
BLOOD COLLECTION CONTAINER
Murray Aaron Blaivas, New York, N.Y., assignor to Hoffman-La Roche Inc., Nutley, N.J.
Filed Jan. 5, 1973, Ser. No. 321,430
Int. Cl. B04b 9/12
U.S. Cl. 233—26 1 Claim



An improved blood collection container having a reduced portion disposed between its closed longitudinal ends and a stopper means disposed therein and adopted under the influence of centrifugal force to be securely received in the reduced portion is described.

3,786,986
CENTRIFUGE ROTOR ASSEMBLY
Michael Carl Guerrero, Miami, Fla., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Sept. 7, 1972, Ser. No. 287,095
Int. Cl. B04b 9/12
U.S. Cl. 233—26 13 Claims



An improved centrifuge rotor assembly having a plurality of tube-receiving sleeves pivotally mounted about the periphery of the rotor, each sleeve being associated with a spring

member. Each spring has a pair of flexible fingers, one of which is disposed within the tube-receiving sleeve for frictionally holding a centrifuge tube within that sleeve. The other finger bears against the rotor to urge the sleeve into a vertical position, thereby cushioning pivotal movement of the sleeve (and the tube supported therein) under the influence of centrifugal force as the rotor accelerates, and holding such sleeve in a position generally parallel with the axis of the rotor when the rotor is stationary.

3,786,987

METHOD OF AUTOMATICALLY MAKING PATTERN CARDS FOR JACQUARD LOOMS

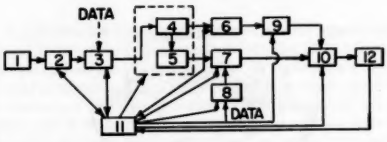
Shigeru Nishikawa; Hitoshi Akami, and Atsuo Shibuya, all of Tokyo, Japan, assignors to Director-General of agency of Industrial Science and Technology, Tokyo-to, Japan

Filed Sept. 29, 1971, Ser. No. 184,925

Claims priority, application Japan, Sept. 29, 1970, 45-85272

Int. Cl. G06k *1/02*

U.S. Cl. 234—2 **2 Claims**



A method of automatically making pattern cards for Jacquard looms or for controlling the operation of the loom directly in which the pattern or design to be woven is scanned directly and signals corresponding to location and color of changes in such pattern or design are fed to a computer for controlling a card punching machine or the operation of the loom directly.

3,786,988

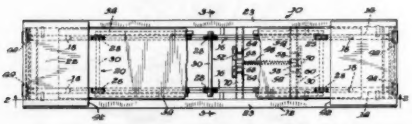
CORRELATOR FOR AUTOMOBILE WASHING INSTALLATIONS

William H. Thompson, Mount Prospect, Ill., assignor to Trans-Clean, Inc., Glenview, Ill.

Filed Feb. 25, 1972, Ser. No. 229,386

Int. Cl. B61b *13/12*

U.S. Cl. 238—4 **11 Claims**



A correlator for properly aligning the front of a vehicle which is about to be washed in a conveyorized automatic auto laundry installation. A load-bearing plate is capable of lateral movement in two directions over a series of wheel assemblies which comprise no load-carrying bearings. The plate is returned to a null position after movement in either direction by a single, pre-loaded spring.

3,786,989

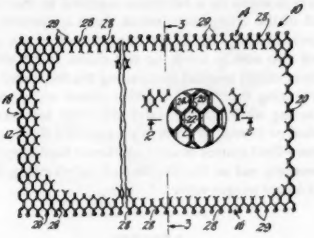
TRACTION MAT FOR AUTOMOBILES

Lincoln W. Haynes, 71 Raporeda Rd., Wilmington, Vt.

Filed Dec. 23, 1971, Ser. No. 211,220

Int. Cl. E01b *23/00*

U.S. Cl. 238—14 **1 Claim**



A traction mat for placement beneath the driving wheel of an automobile disabled on an ice- or snow-covered road. The mat comprises an inexpensive, one-piece, expendable elongate flat sheet of expanded metal such as metal lath, having a substantially rectangular shape and characterized by a plurality of slit portions formed by transverse slits in the metal. The sheet has a pair of opposite, longitudinal edge or margin portions formed by cutting across the sheet. This normally would result in a plurality of sharp protrusions which are formed by the cutting. To prevent injury to the user and daage to surrounding objects from scratching by the protrusions, a plastic substance is applied to the sharp protrusions, preferably by dipping the latter into a bath of plastic in a molten state and allowing the plastic substance to solidify, whereby the protrusions become coated with beads or globules of plastic.

3,786,990

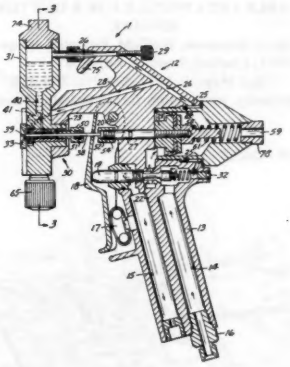
PLURAL COMPONENT GUN

Gerald D. Hagfors, Columbia Heights, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed July 17, 1972, Ser. No. 272,607

Int. Cl. B05b *7/04*

U.S. Cl. 239—112 **10 Claims**



An improved internal mix plural component spray gun. This gun is of the solventless type that has as its major method of purging the barrel bore that acts as a mixing chamber, a movable valve rod. The rod may have a spray pattern and mixing device on its front end. A lubricating device for the rod may

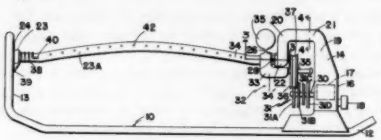
be added to this specific rod feature in combination or may be used by itself for any rod. The front end of the rod is rotated near the chemically-reactive plural component inlets to the mixing chamber to adjust the degree of change for the spray pattern and/or component mixing. Specially designed flatten deflecting rod surfaces accomplish this result. The rod may be made to reciprocate in its barrel bore to purge the mixed components and control the flow from the component inlets. This movement is aided by a lubricant supplied to the rod usually rearward of the component inlets. Such a lubricant substantially eliminates sticking of the movable rod in any of its positions and also acts to keep the rod clean. Fluid jets near the barrel front outlet also aid in cleaning the front end of the rod and preventing the mixed reactive plural components from fully reacting while on the valve rod. The lubricant may be gravity-fed or force-fed from a pressurized fluid source. If a pressurized fluid source is used, the same fluid may be used to simultaneously act as the mentioned rod-cleaning jets by actuating a single trigger valve.

3,786,991

WATER SPRINKLER

Lawrence Allister Ingham, Box 112, Lanigan, Saskatchewan, Canada

Filed Oct. 31, 1972, Ser. No. 302,554
Int. Cl. B05b *3/08*
U.S. Cl. 239—236 **4 Claims**



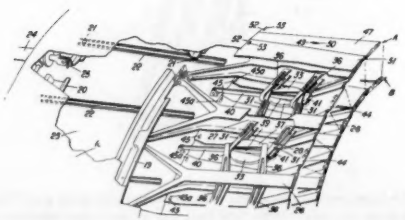
An oscillating tube is mounted in a frame and connected to a hose. The tube is oscillated by a water motor which drives a shaft carrying a plurality of cams for different patterns of water coverage. A wheel is connected to a carrier which in turn is secured to the tube and the wheel can be slid along a pin to engage any one of the fixed cams thus varying the pattern readily and easily and eliminating all linkage, crankshafts, connecting rods and the like normally present.

3,786,992

VARIABLE AREA NOZZLE FOR A GAS TURBINE ENGINE

Norman Robert Robinson, Duffield, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed May 31, 1972, Ser. No. 258,378
Claims priority, application Great Britain, June 11, 1971, 27417/71
Int. Cl. B64c *15/06*
U.S. Cl. 239—265.39 **10 Claims**



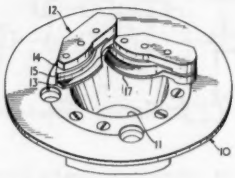
A variable area nozzle for a gas turbine engine comprises an annular array of primary flap members pivoted at their upstream ends for movement of their downstream ends towards or away from the axis of the array. The primary flap members are provided with roller tracks which co-operate with roller tracks of adjacent primary flap members to define tapered roller trackways. Rollers are positioned in the roller trackways such that relative axial movement between the rollers and roller trackways urges the downstream ends of the primary flap members towards or away from the axis of the array.

3,786,993

CONTROL SYSTEMS FOR ROCKET MOTORS

Brian Burgess, Bendley, and Geoffrey Philip Thorp, Kidderminster, both of England, assignors to Imperial Metal Industries (Kynock) Limited, Birmingham, Warwickshire, England

Continuation-in-part of Ser. No. 62,499, Oct. 10, 1970, abandoned, Continuation-in-part of Ser. No. 62,500, Oct. 10, 1970, abandoned. This application May 22, 1972, Ser. No. 255,668
Int. Cl. B63h *11/10*
U.S. Cl. 239—265.19 **6 Claims**



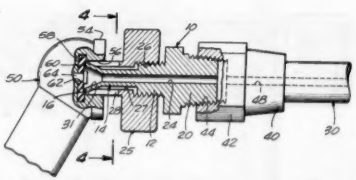
Thrust vector control system for a rocket motor comprising at least one spoiler blade pivotally mounted adjacent the exit end of the motor nozzle, the blade comprising an exhaust gas impingement element of refractory metallic material, a rigid metallic support, and an interposed layer of heat insulating material.

3,786,994

ADAPTOR UNIT FOR USE WITH FLUID NOZZLES

Charles E. Kukes, Glendale; Richard H. Volheim, Los Angeles, and Carl Erikson, Glendale, all of Calif., assignors to Alan Scott, Los Angeles, and Charles E. Kukes, Glendale, both of Calif.; a part interest to each

Filed July 27, 1972, Ser. No. 275,795
Int. Cl. F16k *15/20*
U.S. Cl. 239—569 **7 Claims**



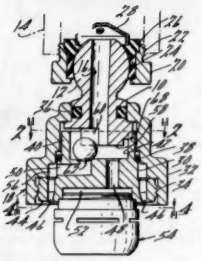
An adaptor unit adapted for sealing connection with a fluid nozzle, particularly, an air nozzle to provide connection between it and a tubular extension fitting having an air nozzle at the end particularly adapted for reaching into the valve stem of the inner of a pair of dual tires.

3,786,995

AERATOR SPRAY ATTACHMENT FOR FAUCETS

Alex Manoogian, Grosse Pointe Farms, and Eric V. Pullen, Northville, both of Mich., assignors to Masco Corporation, Taylor, Mich.

Filed May 3, 1972, Ser. No. 250,007
Int. Cl. E03c 1/084
U.S. Cl. 239—428.5 14 Claims



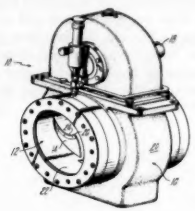
A combination spray and aerator device for attachment to a faucet to selectively discharge water in the form of a conical spray or an aerated stream. The device includes a housing attached to the faucet by a swivel member through which water is discharged into a chamber in the housing having two outlet ports, one of which discharges through an aerating device and the other of which discharges through spray-forming passages. A ball valve member in the chamber is adapted to close one outlet port while opening the other. Rotation of the housing on the swivel member brings one or the other of the outlet ports beneath the ball valve member so as to be closed thereby.

3,786,996

AXIAL FLOW UNIT

Harvey E. Richter, Farmington, Conn., assignor to The Tec Group Inc., Bloomfield, Conn.

Filed Mar. 20, 1972, Ser. No. 236,263
Int. Cl. B02c 18/18
U.S. Cl. 241—46.17 8 Claims



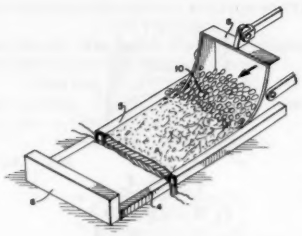
An axial flow unit is provided having a cylindrical rotor with impeller blades extending radially inwardly from the inside wall of the rotor and terminating in an elongated knife-like cutting edge. The radial distance of the cutting edge of each blade from the inside rotor wall progressively increases from one end of the blade toward its opposite end. The blades are arranged in helical symmetrical relation about the major longitudinal axis of the rotor, and a blade profile in a plane normal to that axis provides a projection with each blade in spaced relation to an adjacent blade.

3,786,997

APPARATUS FOR RECOVERING UNUSED CONCRETE

Richard L. Viner, 10110 Chapel Rd., Potomac, Md.

Filed Apr. 25, 1972, Ser. No. 247,464
Int. Cl. B02c 1/04
U.S. Cl. 241—101.7 3 Claims



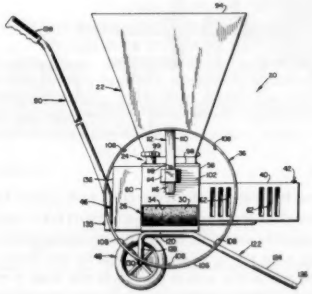
Apparatus and method for recovering unused concrete. A form is provided which is defined by a foundation having a backstop and rails or channel irons secured on the top surface along the sides of the foundation. Unused concrete is poured into the form, leveled to a depth of approximately one-half inch more than the size of the coarse aggregate in the concrete mixture and allowed to achieve final set. Crushing means is then moved forward in the form on the top surface of the foundation so that the hardened unused concrete is broken into relatively small particles which may be used as aggregate in new concrete mixtures.

3,786,998

COMMINUTION APPARATUS

Donald G. Risko; Donald R. Bosten, and Michael Rusnak, all of Pittsburgh, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 19, 1972, Ser. No. 219,012
Int. Cl. B02c 21/02, 4/02
U.S. Cl. 241—101.7 15 Claims



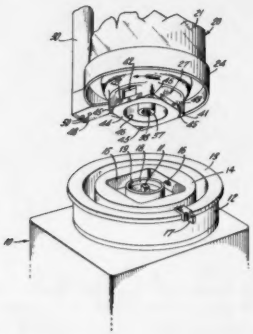
Comminution apparatus including two components rotating in opposite directions at different speeds and having a plurality of radially extending, elongated elements for reducing in size material fed into the nip between the components.

3,786,999

SAFETY MECHANISM TO PREVENT SHAFT COUPLING WHEN BLADES ARE EXPOSED IN A BLENDER

Douglas N. Cabell, Bloomfield Hills, Mich., assignor to Ronson Corporation, Woodbridge, N.J.

Filed Jan. 11, 1972, Ser. No. 216,934
Int. Cl. B02c *18/12*
U.S. Cl. 241—282.1 11 Claims



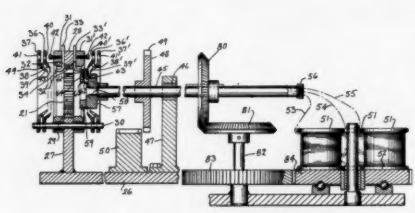
A safety mechanism to insure that a blender jar is properly mounted over the high speed comminuting blades of a blender to prevent exposure of the blades when they are revolving. The jar must be inserted on a base member properly and twisted to a locked position to enable the base, which has a portion of the driven blade shaft in it, to be connected to the drive shaft of the blender.

3,787,000

WAVE FORM COIL WINDING MACHINE

Lemoyne E. Farnsworth, Racine; Bruce R. Pitt, Wilwaukee, and John W. Wolf, Colgate, all of Wis., assignors to Ro-Band Corporation, Menomonee Falls, Wis.

Filed May 19, 1971, Ser. No. 144,752
Int. Cl. H02k *15/085*
U.S. Cl. 242—1.1 R 11 Claims



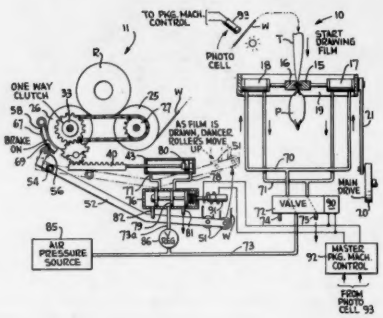
Apparatus for winding electrical coils with a wave form pattern into the slots of cores includes a support for a core, a wire feeding, rotatably indexible head which is reciprocable axially of the core, wire laying needles carried by the head, guiding fingers over which the wire is guided as the head is rotatably indexed, and axially movable retainer means for holding previously wound sequences of wire toward the bases of the core slots as additional sequences are being wound. The fingers and needles are radially adjustable toward the center of the core in preparation for subsequent winding. The wire supply is supported on a turntable positioned to rotate as the wire is withdrawn to prevent twisting during rotatable indexing of the head.

3,787,001

WEB ROLL CRADLE WITH POSITIVE DRIVE

Nelson R. Henry, Decatur, Ga., assignor to The Woodman Company, Inc., Decatur, Ga.

Filed Mar. 14, 1972, Ser. No. 234,494
Int. Cl. B65h *17/08, 75/02*
U.S. Cl. 242—75.43 22 Claims



Apparatus and method of cyclic or intermittent feeding and unwinding of sheet material includes a pneumatic motor that drives the rotary web roll support and a brake that serves to stall out the motor when the predetermined length of material has been unwound. Draw means is provided to draw the predetermined length of film in a manufacturing process, such as packaging, with a slack loop being formed between the draw means and the web roll. The pneumatic motor is preferably a cylinder and rack combination with a drive stroke producing a capability greater than said predetermined length with the brake stalling out the motor at the end of the stroke to assure proper feed during each cycle and to maintain the tension in the web at a minimum and substantially constant during the complete operation. The slack loop is formed by a dancer assembly with linkage means comprising a cam and leaf spring applying the brake in a progressive manner only during the final moments of unwinding of the material. The dancer assembly desirably has insufficient pulling or tensioning power to pull film from the web roll so that complete reliance for feeding is put on the positive drive. The drive means and the draw means are operated at mutually exclusive times and are coordinated by first and second valves that actuate the drive means as the draw means are withdrawn to complete the drawing step.

3,787,002

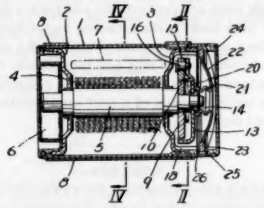
EMERGENCY LOCKING DEVICE FOR SAFETY SEAT BELT USED IN MOTOR VEHICLES AND THE LIKE

Yoshihiro Hayashi, Toyota, and Masahiro Iwatsuki, Anjo, both of Japan, assignors to Kabushiki-Kaisha Tokai Rika Denki Seisakusho, Aichi-ken, Japan

Filed Oct. 12, 1971, Ser. No. 188,141
Claims priority, application Japan, Oct. 20, 1970, 45-104208; Oct. 20, 1970, 45-104210
Int. Cl. A62b *35/02*; B65h *63/04*
U.S. Cl. 242—107.4 3 Claims

An improvement in an emergency locking device for a

safety seat belt in which a webbing roller is locked against rotation in the uncoiling direction as it is about to rotate at a



speed higher than a certain predetermined value as a result of a sudden uncoiling or protracting movement of said safety belt.

3,787,003

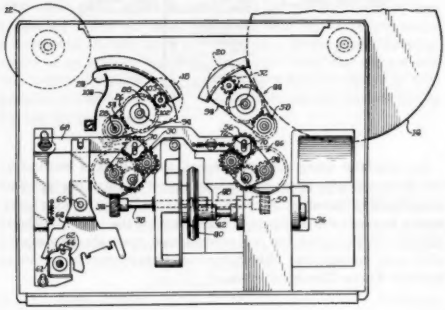
DUAL REEL DRIVE

Nicholas Mischenko, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed July 25, 1972, Ser. No. 275,033

Int. Cl. G03b *1/04*; G11b *15/32*

U.S. Cl. 242—192 **8 Claims**



A motion picture projector having a roller drive for winding film on both the take-up and supply reels.

3,787,004

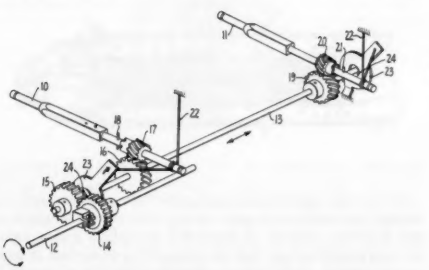
SPINDLE BRAKING MECHANISM FOR MICROFILM READER

Lyle Gilbert Priest, Palo Alto, Calif., assignor to Information Design, Inc., Menlo Park, Calif.

Filed June 30, 1972, Ser. No. 268,095

Int. Cl. B11b *15/32*; G03b *1/04*

U.S. Cl. 242—204 **5 Claims**



A spindle braking mechanism for microfilm readers and the like comprising a pair of spindles either one of which may be driven from a common drive shaft through pairs of helical gears producing a thrust on the drive shaft which is proportional to the driving torque. This thrust is utilized to control the braking force of uni-directional braking devices, one such device being applied to each spindle to avoid overrun.

3,787,005

MEANS FOR TRANSPORTING MOTION PICTURE FILM OR THE LIKE

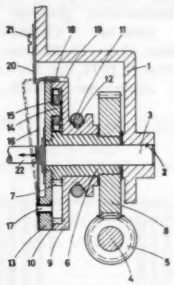
Wolfgang Riedel, Winnenden, Germany, assignor to Robert Bosch Photokino GmbH, Stuttgart, Germany

Filed Mar. 31, 1972, Ser. No. 240,254

Claims priority, application Germany, Apr. 1, 1971, 2115873; Nov. 3, 1971, 2154546

Int. Cl. B11b *15/32*; G03b *1/04*

U.S. Cl. 242—205 **19 Claims**



The supply reel of a cinematographic apparatus is driven by the internal gear of a planetary transmission whose sun gear receives torque from an electric motor. The cage for the planet pinions can be coupled to the internal gear so that the latter rotates with the sun gear at a high speed in a direction to collect the film on the reel. When the cage is disengaged from the internal gear, it is held against rotation by a stationary stop so that the internal gear rotates the reel at a lower speed and in a direction to pay out the film. The cage can be further coupled to an elastic clamping device which is in frictional engagement with the internal gear so that the clamping device can slip with reference to the internal gear when the film offers a relatively low resistance to transport in a direction to be collected by the reel.

3,787,006

SYSTEM FOR PNEUMATICALLY ADVANCING A CONTAINER WITHIN A DUCT

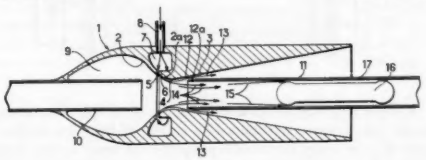
Henri Coanda, Paris, France, assignor to Institutul Pentru Creatie Stiintifica Si Technica, Bucharest, Romania

Continuation of Ser. No. 32,958, April 29, 1970. This application Apr. 7, 1972, Ser. No. 242,212

Claims priority, application France, June 6, 1969, 69.18838

Int. Cl. B65g *51/04*

U.S. Cl. 243—6 **14 Claims**



A system for advancing a container along a duct comprises suction nozzles between successive duct sections, which noz-

zles are provided with circumferential slots through which air is introduced under pressure. The slots are contoured to lead the incoming air toward a tube section which projects into the divergent part of the nozzle and defines a gas outlet between it and said divergent part.

3,787,007

DEVICE FOR DRIVING TRAINS OF CONTAINERS THROUGH PIPELINE

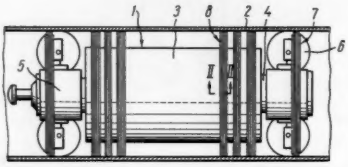
Adolf Moritsovich Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8, Moscow; Ruben Dzhangirovich Balaian, Ljubertsy, Volkovskaya ulitsa, 9, kv. 31, Moskovskaya Oblast; Ippolit Davidovich Suladze, Prospekt Chavchavadze, 11, kv. 41, Tbilisi; Vladimir Efimovich Aglitsky, Zatsepsky val, 6/13, kv. 61, Moscow; Avtandil Semenovich Kakhniashvili, ulitsa Eliava, 37, kv. 41, Tbilisi; Ilia Solomonovich Kantor, Malo-Moskovskaya ulitsa, 31. kv. 45, Moscow; Vazha Venediktovich Dzhanelidze, prospekt Plekhanova, 140, Tbilisi, and Alexandr Alexandrovich Lachinov, Zhivopismaya ulitsa, 12, kv. 19, Moscow, all of U.S.S.R.

Filed Mar. 9, 1971, Ser. No. 122,478

Claims priority, application U.S.S.R., Mar. 18, 1971, 1411851

Int. Cl. B65g *51/04, 51/06*

U.S. Cl. 243—33 **2 Claims**



A device for driving a train of containers through a pipeline in which a housing rests through trunnions on wheel trucks which support disks taking the pressure of the gas flow passing through the pipeline. The housing has an elastic sealing means closing the gap between the internal surface of the pipeline and the external surface of the housing.

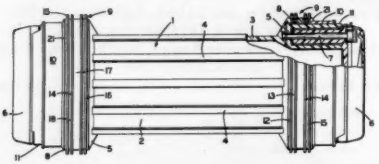
3,787,008

PNEUMATIC TUBE SYSTEM CARRIER WEAR RING CONSTRUCTION

Charles B. Barnett, Akron, and Pieter J. Ekama, Malvern, both of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed July 3, 1972, Ser. No. 268,830

Int. Cl. B65h *49/26*

U.S. Cl. 243—35 **3 Claims**

A wear ring seal construction for a carrier used in a pneumatic tube system, particularly a carrier of the type having a pair of wear rings surrounding the carrier body spaced from each other and from the ends of the carrier. The wear rings each are formed of a plurality of ring layers or laminations of a special material which flexes easily to accommodate out-of-roundness of the tube cross section, and indentations or sharp projections in the interior of the tube wall. The ring layers have alternately large and small diameters and different thicknesses and the arrangement of ring layers preferably is symmetrical about a center plane perpendicular to the ring axis. The wear rings are replaceable and have a minimum contact with the tube inner surface during travel through the tube while providing an efficient seal. Further, the minimum surface contact between wear ring and tube results in a mininum area on the edges of the seal rings for the collection of material which can soil the hands of a user manipulating the carrier when removed from the tube.

3,787,009

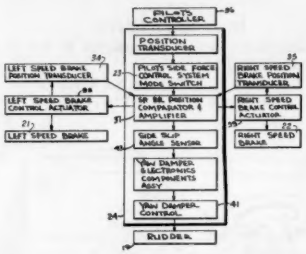
DIRECT SIDE FORCE CONTROL DEVICE

Wilbert G. Wheldon, Palos Verdes Peninsula, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Aug. 24, 1970, Ser. No. 66,449

Int. Cl. B64c *13/04*

U.S. Cl. 244—83 E **8 Claims**


PILOT'S CONTROLLER
POSITION TRANSDUCER
PILOT'S SIDE FORCE CONTROL SYSTEM MODE SWITCH
LEFT SPEED BRAKE POSITION TRANSDUCER
RIGHT SPEED BRAKE POSITIONAL TRANSDUCER
LEFT SPEED BRAKE CONTROL ACTUATOR
SP. BR. POSITION COMPARATOR & AMPLIFIER
RIGHT SPEED BRAKE CONTROL ACTUATOR
LEFT SPEED BRAKE
SIDE SLIP ANGLE SENSOR
RIGHT SPEED BRAKE
YAW DAMPER ELECTRONICS COMPONENTS ASSY
YAW DAMPER CONTROL
RUDDER

An airplane using the rudder and speed brakes located at the aileron position, or otherwise located at the wing tips and capable of differential operation, to provide a pure side force acting to alter the horizontal flight path of the plane, without sideslip or the need for roll movements normally associated with such maneuvers. This device is hereinafter referred to as the Side Force Control System.

3,787,010

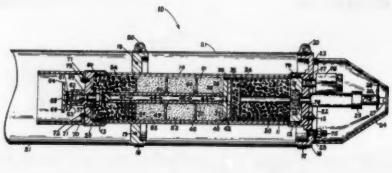
INFLATING APPARATUS

George Meranshian; Raymond C. Sutter; Osyp Nimylowycz, all of Philadelphia, Pa., and Wilmer White, Haddonfield, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 6, 1973, Ser. No. 348,810

Int. Cl. B01j *7/00*

U.S. Cl. 244—146 **8 Claims**



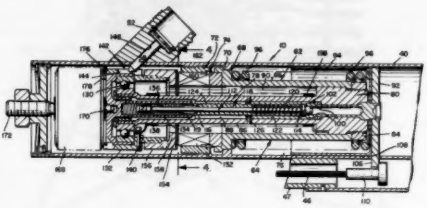
A small and lightweight rapid gas inflating apparatus for inflating a paraglider with gas having a minimum of temperature and moisture content. A generated propellant gas is passed through a baffle plate, bed of charcoal for reduction in water vapor content, then radially dispersed through a coolant of ammonium carbonate and passed through a gas filtering anhydros body for absorption of water before being deflectively delivered in the parawing of the paraglider.

3,787,011

PARACHUTE RELEASE

John J. Phillips, Rolling Hills, and Thomas A. Clark, Santa Monica, both of Calif., assignors to G & H Technology, Inc., Santa Monica, Calif.

Filed Apr. 10, 1972, Ser. No. 242,587
Int. Cl. B64d *17/58*
U.S. Cl. 244—150 10 Claims



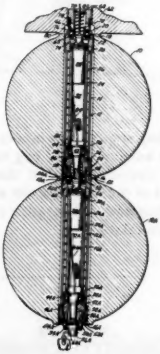
A parachute release is disclosed herein for automatically deploying a parachute without any assistance from the pilot. The release is effective to deploy the parachute within some predetermined short interval of time such as ½ to 2 seconds after the pilot has ejected from his aircraft and/or has separated from his seat, provided that he is below some preselected altitude such as 15,000 feet. In the event the pilot ejects at an altitude which is above this level, the release will not deploy the parachute until the pilot has free-fallen to that preselected level at which time the release will automatically deploy the parachute.

3,787,012

INTERNAL EJECTOR MECHANISM FOR STACKED SEQUENTIALLY RELEASABLE SEPARABLE UNITS

Thaddeus Jakubowski, Jr., Long Beach, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Feb. 5, 1973, Ser. No. 329,660
Int. Cl. B64d *1/04*
U.S. Cl. 244—137 R 9 Claims



An internal ejector mechanism for releasably fastening stacked and sequentially separable units to a carrier unit. The carrier unit contains a mounting bracket or lug having a plurality of latching balls radially movable through its cylindrical walls. When the balls are urged outwardly by a ball retention plunger they fit within a groove in the ejector housing in the separable unit to lock it to the carrier unit. A cartridge actuated piston in the separable unit moves the ball retention plunger to permit inward movement of the balls, freeing the ejector housing and releasing the separable unit.

The stacked separable units are interchangeable and provide for sequential release starting with the outermost unit. Each separable unit has a threaded cavity liner in which a disposable ejector fits. The ejector consists of a cylinder threaded into the liner, an ejector piston movable within the cylinder, an explosive cartridge, a plunger actuator and cartridge cap with electrical contacts.

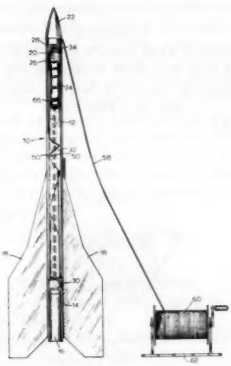
Each separable unit has at its outer, lower or other end to which an additional unit may be attached a further locking arrangement to prevent piston movement within the cylinder when such additional unit is attached. This locking arrangement also includes locking balls between a lower lug threaded into the cylinder and the movable piston within the cylinder. A plunger within the lug keeps the balls moved outwardly into the cylinder grooves until the plunger is moved upwardly by the separation of the outermost separable unit. Thus, release of the outermost separable unit releases the piston in the innermost separable unit for movement and subsequent release of the innermost separable unit.

3,787,013

FOLDABLE KITE AND ROCKET LAUNCHING MEANS THEREFOR

James H. McKenzie, Sr., 1202 W. King St., York, Pa.

Filed Sept. 13, 1972, Ser. No. 288,744
Int. Cl. A63h *27/08*
U.S. Cl. 244—155 R 5 Claims



A foldable kite adapted to be compactly arranged in a manner to have a small cross section for storage within the hollow interior of a minature, toy-like rocket having a rocket engine in the normally rearward end thereof and the opposite end of the rocket body having a conical nose removably mounted therein. The folded kite is positioned adjacent to rocket engine and the normally outer end of the rocket body has a compactly folded parachute stored therein and connected to the body of the rocket as well as to said nose. The rocket engine has a delay charge therein which, when the rocket has been projected to a predetermined height is fired automatically to project the nose and the parachute which is connected thereto, as well as the kite, and a tether cord extends from the kite down to a compact arrangement of such cord adapted to rapidly pay out as the rocket and kite ascend but permit a person to control the flight of the kite by said cord, while the rocket is recovered due to the parachute permitting its gradual decent without injury.

3,787,014

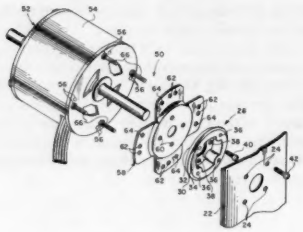
REPLACEMENT MOTOR MOUNTING

Robert S. Story, 1419 Oak Vista, Dallas, and Arvind S. Patel, 818 Dorian Way, Grand Prairie, both of Tex.

Continuation of Ser. No. 154,421, June 18, 1971, abandoned. This application Apr. 30, 1973, Ser. No. 355,453

Int. Cl. H02k *5/04*

U.S. Cl. 248—14 **8 Claims**



A replacement motor mounting includes an adapter plate comprising a circular central portion and four arms which extend radially outwardly from the central portion. A first set of fastener receiving holes is formed in the central portion in the pattern of the fastener receiving holes of a mounting structure designed to support an original equipment motor. Two second sets of fastener receiving holes are formed in the arms in the patterns of the fastener receiving holes of two types of replacement motors. The central portion is displaced axially from the arms to admit air to a replacement motor supported on the adapter bracket.

3,787,015

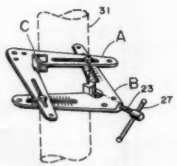
BRACKET FOR POLES AND THE LIKE

Allan H. Ablett, P.O. Box 1128, Wildwood, Fla.

Filed Nov. 14, 1972, Ser. No. 306,430

Int. Cl. F16m *13/02*

U.S. Cl. 248—43 **3 Claims**



A bracket for poles and the like having a pair of bracket elements capable of being swung open to encircle a pole at the position it is desired to mount the bracket with fastening means for securing the bracket thereon and an attachment thereto that permits the fastening of the bracket to a pole for supporting a second pole or antenna; the bracket having a movable centering member that can be rotated to engage a horizontally positioned member such as a girder or planking and be mountable thereon.

3,787,016

RACK FOR SUPPORTING CABLES AND THE LIKE

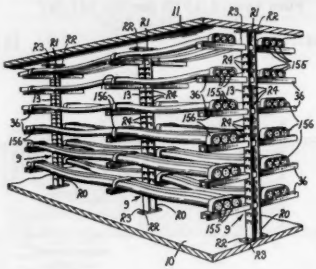
Claude C. Laval, Jr., 2444 N. Farris, Fresno, Calif.

Filed Apr. 20, 1972, Ser. No. 245,948

Int. Cl. F16l *3/22*

U.S. Cl. 248—49 **8 Claims**

A rack having a substantially upright support providing a transverse passage defined at its lower side by an upwardly extended lip, an arm slidably received by the passage having a notch fitted downwardly over the lip, and a spacer received in



the passage in engagement with the arm blocking removal of the arm from the lip.

3,787,017

PORTABLE GOLF BAG STAND

Richard W. Sauer, 8 Coopers Run Dr., Cherry Hill, N.J.

Filed July 28, 1971, Ser. No. 166,816

Int. Cl. A63b *55/06*

U.S. Cl. 248—96 **7 Claims**

A portable golf bag stand wherein a cross member extends freely through and beneath a golf bag handle, and a pair of legs depend from opposite ends of the cross member for swinging movement of the legs between an inoperative condition alongside the bag and an operative condition suspending the bag in an inclined relation.

3,787,018

BASE FOR AN UPRIGHT FOR FORMING A STAND OR THE LIKE

Walter Nathan, Glencoe, Ill., assignor to RTC Industries, Inc., Chicago, Ill.

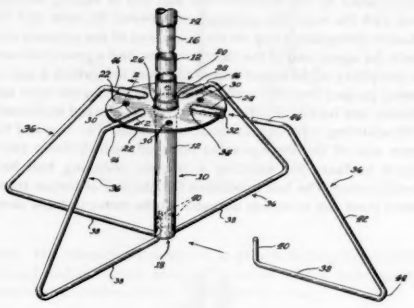
Filed June 8, 1972, Ser. No. 260,817

Int. Cl. F16m *11/20*

U.S. Cl. 248—165 **5 Claims**

A base for an upright for forming a display stand or the like, which base is formed of a plurality of legs which interlock with the upright without the use of any extraneous fastening elements and/or tools by the positioning of the legs in relation to

the upright, and wherein the legs are readily detachable from the upright for the purpose of collapsing the base so that it occupies a minimum of space in a carton or storage area when collapsed, and which may be readily set up.



3,787,019

SUPPORTING ELEMENT OF ADJUSTABLE LENGTH

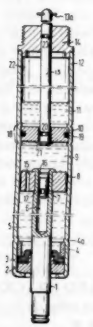
Herbert Freitag, Koblenz-Lutzel, Germany, assignor to Stabilus Industrie und Handelsgesellschaft MBH, Koblenz-Neuendorf, Germany

Filed Apr. 3, 1972, Ser. No. 240,646

Claims priority, application Germany, Apr. 6, 1971, P 21 16 699.4

Int. Cl. F16f *9/32*

U.S. Cl. 248—188.2 **10 Claims**



A normally upright, telescopically adjustable, supporting element, such as a leg for a stool, has a cylinder whose cavity is axially divided into two chambers by a partition. The lower chamber is liquid-filled, the upper chamber contains liquid under the pressure of a gas cushion, and the two chambers may be connected by a valve in the partition. The position of a plunger axially projecting from the lower chamber is generally determined by the amount of non-compressible liquid in the lower chamber, but limited axial movement is made possible by a gas cell partly bounded by the plunger and otherwise by a sealing member separating the gas in the cell from the liquid in the lower chamber.

3,787,020

CONCRETE FORMING STRUCTURE

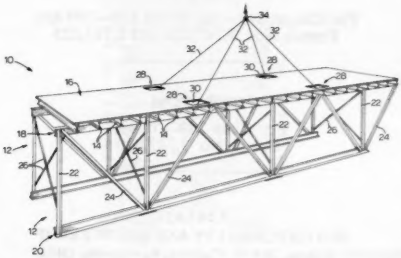
Peter J. Avery, Toronto, Ontario, Canada, assignor to Aluma Building Systems Incorporated, Downsivew, Ontario, Canada

Filed Dec. 2, 1971, Ser. No. 204,132

Claims priority, application Canada, Nov. 12, 1971, 127,439

Int. Cl. E04q *11/48*

U.S. Cl. 249—18 **4 Claims**



A concrete forming structure is provided wherein a pair of substantially parallel trusses have a plurality of beam members placed transversely across their upper end with a substantially planar upper deck secured to the upper edges of the beams. Each beam has an upper portion which comprises an open, inverted top hat section into which a wooden joist member may be forced and graspingly secured in snug manner. Panels, such as plywood, which are usually used for concrete forming, may be nailed or screwed to the concrete forming structure at the wooden joists engaged in the open top hat sections of the beams. The deflection resistance of a beam having a wooden joist graspingly and snugly secured therein is improved over that of an I-beam having a similar metal cross-section. When a floor panel poured on the concrete forming structure is cured, the structure may be lowered from beneath that panel and "flown" using known construction cranes to a position several storeys above the floor from which it had just been removed in order for a new floor panel to be poured on the emplaced concrete forming structure.

3,787,021

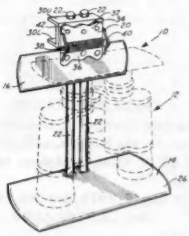
BINOCULAR HOLDER

Thomas A. Horst, Lafayette, Colo., assignor to Western Sales and Supply Co., Denver, Colo.

Filed Aug. 7, 1972, Ser. No. 278,579

Int. Cl. F16m *13/00*

U.S. Cl. 248—316 B **6 Claims**



This invention relates to an adjustable carrier for use in automobiles and the like as a means to releasably hold a pair of

binoculars ready for instant use. It comprises a horizontally disposed padded platform upon which the objective lenses rest that has a pair of parallel upright posts at the rear edge thereof that are slidably received in the parallel flanges of a channel-shaped mounting bracket. The web of said bracket mounts one leaf of a spring hinge, the remaining leaf of which is fastened atop a foldable pad that is biased down on top of the binocular eyepieces thus cooperating with the platform to releasably retain same.

ERRATA

For Classes 248—361 B and 248—399 see:
Patents Nos. 3,787,024 and 3,787,025

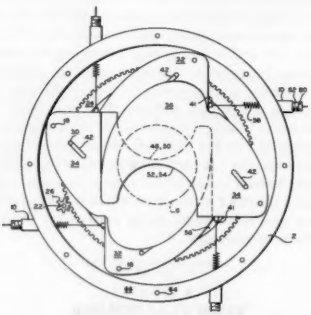
ERRATUM

For Class 249—18 see:
Patent No. 3,787,020

3,787,022
IRIS CHECK VALVE AND USE THEREOF

Charles F. Wilcox, 201 W. Cudahy, Bartlesville, Okla.

Filed May 22, 1972, Ser. No. 255,648
Int. Cl. F16k *3/03*
U.S. Cl. 251—212 **9 Claims**



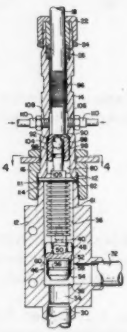
An iris type check valve is provided having at least one matched pair of vanes which are actuated by a rotating plate to modify the size of the orifice and thus regulate flow of materials through the unit. The vanes are constructed to provide an interlocking of the respective vane members of the matched pair. Thus the valve unit is capable of withstanding extremely high fluid pressures. The use of the valve in discovery and production of underground fluids is also described.

3,787,023
BELLOWS VALVE

Earl D. Shufflebarger; Bernard J. Gallagher, both of Mentor; David M. Simko, Parma Heights, and John R. Boylan, Cleveland Heights, all of Ohio, assignors to Nupro Company, Cleveland, Ohio

Filed Aug. 5, 1971, Ser. No. 169,316
Int. Cl. F16k *41/04*
U.S. Cl. 251—335 B **22 Claims**

A valve including a bonnet mounted on a body and having an actuator carried in a central passage in the bonnet. The body includes a fluid passageway connecting an inlet and an outlet, an annular sealing seat in the passageway and a bore intersecting the passageway substantially coaxially with said seat. The central passage in the bonnet is aligned substantially coaxially with the bore in the body, and the inner end of the actuator is connected to a non-rotatable stem which is reciprocated by the actuator into and out of sealing engagement with the seat. The connection between the stem and the actuator comprises a cup on the lower end of the actuator into which the upper end of the stem projects, and a groove around the periphery of the upper end of the stem into which a pair of detents project from the wall of the cup. Thereby the stem and actuator are locked together for coordinated axial movement while allowing relative rotational movement. The cup and the upper end of the stem present opposed, substantially cone-shaped surfaces for abutting a friction reducing ball held therebetween. The ball minimizes the amount of torque transmitted from the rotatable actuator to the non-rotatable stem.



The lower end of the stem carries sealing means for co-acting with the valve seat and includes a plug mounted within a polygonal body having a plurality of rounded guiding corners for engaging the bore wall. A bellows surrounds a portion of the stem with its lower end bonded to the stem and its upper end bonded to a weld ring. The weld ring is sealingly clamped between the body and the bonnet. Concentric grooves are formed in the weld ring with at least one of the grooves opening upwardly toward a flat face on the lower end of the bonnet. The upwardly opening groove contains an O-ring sealingly compressed between the flat face of the bonnet and the bottom of the groove. Another groove is sufficiently close to an edge of the weld ring as to form an upstanding flange of radial thickness not substantially greater than the thickness of the bellows. An outwardly flaring surface merges with the terminus of the bonnet passage and its maximum diameter is greater than the diameter of the crest of the flange which is bonded to said bellows.

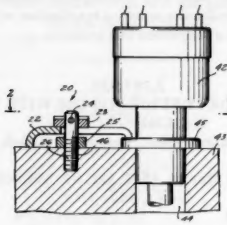
3,787,024
CAM LOCK AND BRACKET ASSEMBLY

Theodore Dzus, Jr., West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed Apr. 7, 1972, Ser. No. 242,077
Int. Cl. B25b *5/08*
U.S. Cl. 248—361 B **10 Claims**

A cam lock and bracket assembly for fastening a removable member to a base. The assembly includes a stud, a bracket and a cam nut. The stud is adapted to be mounted to a base with the bracket adapted to be releasably engaged with a removable member in the base. A cam slot and cam follower are on the stud and cam nut arrangement whereby shifting of these elements permit the assembly to be shifted between a locked and unlocked position. In the locked position the bracket is held in fixed position with a force being exerted on the removable member to retain it in position. In the unlocked

position the bracket is permitted to be shifted away from the removable member permitting it to be disassembled from the



base. The assembly is designed to permit shifting between the locked and unlocked position to occur with a mere quarter turn of a revolution of the cam nut or the stud.

3,787,025

POWER DRIVEN ADJUSTABLE SEAT FOR AUTOMOTIVE VEHICLE

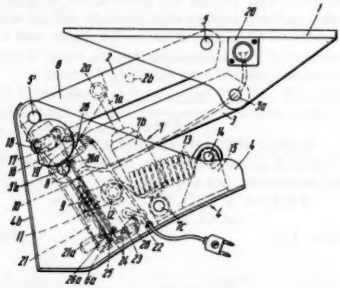
Klaus Sturhan, Lemgo, Germany, assignor to Gebr. Isringhausen, Lemgo/Lippe, Germany

Filed May 5, 1972, Ser. No. 250,570

Claims priority, application Germany, May 12, 1971, 2123399

Int. Cl. B60n *1/02*

U.S. Cl. 248—399 **14 Claims**



A seat for use in automotive vehicles wherein the seat supporting portion is movable toward and away from a base in response to changes in the inclination of two pairs of links which are articulately connected with the base and the seat supporting portion. One or more helical springs may be attached to the base and to a spindle nut which is movable up and down along an adjusting screw, or the helical springs may be connected to either the links or to the seat supporting portion to thereby change the effective moment applied to the seat supporting portion with changes of the position of the spindle. A motor drive turns the adjusting screw to cause the spindle nut to move between two end positions. Switches reverse the current through the motor drive to change directions of rotation of the adjusting screw when the spindle nut has reached either end position along the latter. A cam follower forming part of a switch rides on a cam surface when the seat supporting portion moves relative to the base. The cam follower drops into a cut out in the cam surface when the seat supporting portion is spaced at a desired distance from the base. To thereby deactivate the motor drive. Shock absorbers can be mounted in the same manner as the helical springs.

3,787,026

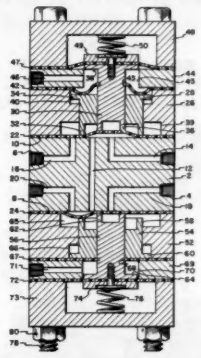
CHROMATOGRAPHY VALVE

Jeffrey M. Lazar, Warminster, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 24, 1972, Ser. No. 309,495

Int. Cl. F16k *31/165*

U.S. Cl. 251—61.1 **7 Claims**



A valve using a valve body having a plurality of valving elements, each valving element including three fluid ports located on a flat face of the valve body. Fluid passages are provided in the valve body to communicate with the fluid ports. A corresponding resilient member covers each valving element and is selectively urged toward the flat face to seal the fluid ports in the respective valving elements from each other. A pair of concentric fluid actuated plungers are slidably supported in a plunger body located on the other side of the resilient member from the valving element and having operative ends arranged to bear on the resilient member. The concentric plungers are selectively urged against the resilient member by either a fluid pressure supplied to a closed volume defined by the other ends of the concentric plungers, by the fluid pressure of a fluid being controlled by the valve or by a stationary spring means arranged to apply axial pressure to one of the plungers.

3,787,027

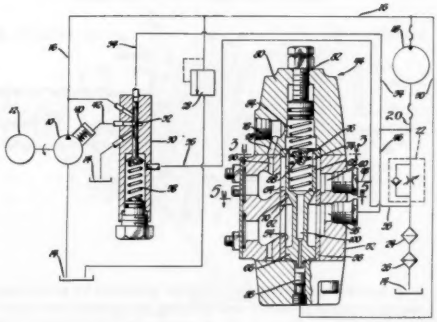
POWER TRANSMISSION

John W. Curnow, Utica, and Harry J. Nowicki, Mt. Clemens, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Oct. 16, 1972, Ser. No. 298,106

Int. Cl. F16k *31/143*

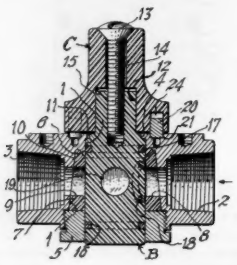
U.S. Cl. 251—63 **4 Claims**



A valve for automatic stabilization of hydraulic motor speed under varying motor loads is arranged to bypass a small flow

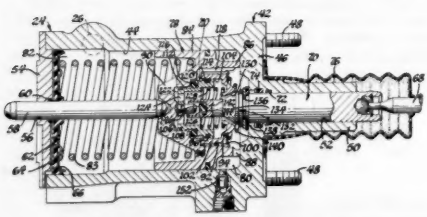
around the principal motor speed regulating valve, which small flow is increased with the motor inlet pressure. This compensates for the cross-port leakage in the motor which varies with motor load. The inner parts of the valve may be selectively assembled in various positions to provide various maximum flow openings so that hydraulic motors of various sizes may be effectively stabilized.

3,787,028
ROTARY PLUG VALVE
Albert L. Semon, 11 Eliot Pl., Short Hills, N.J.
Filed Jan. 20, 1972, Ser. No. 219,219
Int. Cl. F16k *5/00*
U.S. Cl. 251—317 **5 Claims**



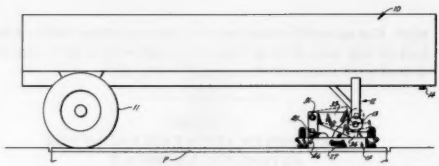
A rotary plug valve whose plug chamber includes a sleeve of plastic material compressed in an opening through the valve body between a shoulder on the wall of said opening and a tubular nut screw-threaded in one end of the opening, said sleeve having inlet and outlet port holes and a plug that has transverse fluid passages being rotatably mounted in said chamber with one end in said tubular nut and its other end provided with a knob adjustable thereon which has a stop stud coactive with the ends of an arcuate stop element which is settable in different positions on the valve body to stop the rotation of the plug selectively in different positions.

3,787,029
OPEN CENTER CONTROL VALVE
Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 76,473, Sept. 29, 1970, Pat. No. 3,699,680. This application Sept. 13, 1971, Ser. No. 179,682
Int. Cl. F16k *47/02*
U.S. Cl. 251—333 **1 Claim**



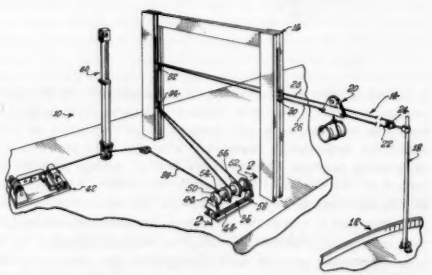
A hydraulic power brake booster powered by power steering gear pump pressure and utilizing an open-center valve so that fluid flows through the booster without pressure reduction when the booster is not activated. The valve assembly includes a radially floating valve seat which provides for self-centering, permits a valve separation operation to pass viscous cold hydraulic fluid or any elements which may tend to overly restrict the valve. It also includes a valve face design providing entrance and exit angles defining a venturi-type passage conducive to laminar flow with consequent reduction in valve noise, and has a hydraulic reaction mechanism which includes an arrangement for supported line pressure.

3,787,030
LIFT SUPPORT DEVICE FOR USE WITH TRUCK WEIGHING SCALES
Ron D. Bieker, Salina, Kans., assignor to Rickel, Inc., Kansas City, Mo.
Filed May 18, 1972, Ser. No. 254,508
Int. Cl. B60p *1/48*
U.S. Cl. 254—8 R **2 Claims**



A wheeled device adapted to be manually directed in a sidewise direction under the front portion of the semi-trailer carries a hydraulic lift engagable with the dolly wheels or support pads of the trailer and operable to elevate the forward end of the trailer sufficiently to break the fifth wheel connection so that the trailer is supported only by its rear wheels and the lift devices. The wheels are constructed to permit the frame to descend into contact with the scale surface when the load is transferred from the tractor to the frame, and while it remains supported by the frame, so that the trailer is immobilized on the scale surface during weighing.

3,787,031
CABLE DRUM HIGHLINE SYSTEM
Peter K. Lucas, Inglewood, Ontario, Canada, assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Dec. 8, 1971, Ser. No. 205,826
Int. Cl. B66d *1/48*
U.S. Cl. 254—172 **16 Claims**



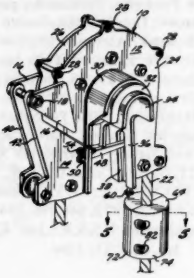
A load-carrying vehicle traverses between supply and receiving vessels at sea, on a closed loop highline of two cable whips terminating at one of the vessels on a pair of drums mechanically interconnected by a differential gear assembly whose spider is coupled to a third drum having a cable coupled to a ram tensioner. The vehicle is snubbed or secured to both the cable whips, and traverse is effected by motor power applied to the drums.

3,787,032

SELF-RELEASING AND SELF-LOWERING BLOCK

Percy R. Bagby, 27844 Conestoga Dr., Rolling Hills, Calif.

Filed Aug. 24, 1972, Ser. No. 283,394
Int. Cl. B66d 1/28, 5/32
U.S. Cl. 254—190 6 Claims



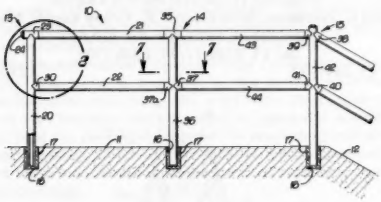
A self-releasing, self-lowering block adapted to rest upon a horizontal support cable. A vertically extending hoisting cable extends about the support cable, through sheaves in the block, and is retained within pivoted sections of the block. A release element attached to the hoisting cable can be raised to effect release of the pivoted sections so that they may move apart and allow the block to drop off the support cable and slide down the hoisting cable. Certain ones of the sheaves of the block are laterally offset to impart a drag upon the block and slow its descent.

3,787,033

JOINT FOR TUBULAR STRUCTURE

Donald E. Snyder, La Habra, and Roy W. Batcheller, West Covina, both of Calif., assignors to Crane-Veyor Corporation, South El Monte, Calif.

Filed Aug. 14, 1972, Ser. No. 280,516
Int. Cl. E04h 17/14
U.S. Cl. 256—59 7 Claims



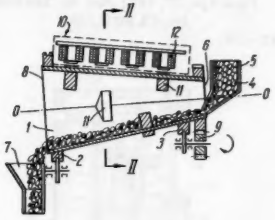
A tubular structure has end posts, intermediate posts and rails which extend between the end posts and intermediate posts. For fastening the rails to a post use is made of a T joint at the top of the post and a cross joint at an intermediate location. For the cross leg of the T joint a hole is made on one side of the cross leg of the same diameter as the post, a square end of the post is pushed in the hole and a weld is applied on the interior of the cross leg to anchor the parts together. A sleeve is inserted into the end of the cross leg with part protruding and this also anchored by a weld applied to the interior. Each end of the rail is then merely slid over the protruding part of the sleeve at each opposite post and no welding appears on the exterior which may need to be ground off.

3,787,034

DEVICE FOR CONTINUOUS MIXING OF POWDERED MATERIALS

Valery Lvovich Shvartsman, ulitsa Kuibysheva 36, kv. 64, Donetsk, and Anatoly Kirillovich Gaiduchenko, ulitsa Oktyabrskoi revoljutsii 19, kv. 16, Kiev, both of U.S.S.R.

Filed July 28, 1971, Ser. No. 166,890
Int. Cl. B01f 9/02, 13/08, 3/18
U.S. Cl. 259—3 6 Claims



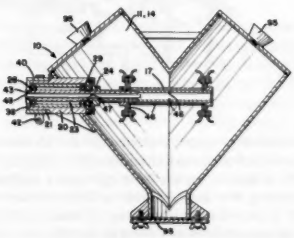
A device for continuous mixing of powdered materials which include ferro-magnetic components, has a drum mounted for rotation on its own axis and made in the form of a polyhedral truncated pyramid. The drum is disposed with the axis inclined to the horizontal and is fed at one end thereof with powdered materials which are to be thoroughly mixed, and the mixed materials are discharged at the other end. The inside of the drum is provided on its longitudinal edges with rigidly mounted baffles which are made of ferromagnetic material, and the baffles are arranged along a helix. A magnetic system which can generate a pulse magnetic field is stationarily mounted above the drum and parallel to a generatrix of the drum. The magnetic field reaches the inside of the drum through the ferromagnetic baffles which act as cores and aids a redistribution and thorough mixing of the ferromagnetic components with the rest of the components in the powdered material. In order to increase the effect of the pulse magnetic field by effectively increasing the proximity of the baffles to the magnetic system, additional ferromagnetic members may be securingly mounted on the outside of the drum to rotate therewith and arranged so as to nearly bridge a gap between the drum and the magnetic means, whereby the effect of the magnetic field inside the drum is increased.

3,787,035

BLENDER WITH INTEGRAL INTENSIFIER

Wilmer G. Bryson, Jr.; Donald D. Lyle, and Jack S. Wilda, all of East Liverpool, Ohio, assignors to Banner Indstries, Inc., East Liverpool, Ohio

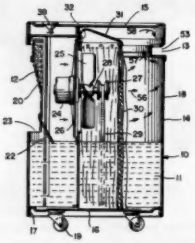
Filed May 9, 1972, Ser. No. 251,804
Int. Cl. B01f 9/08
U.S. Cl. 259—16 13 Claims



A separately rotatable intensifier is contained within a rotatable blending vessel as an integral part thereof. A mount-

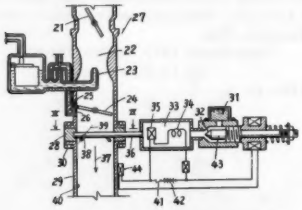
ing unit carried by the vessel mounts the intensifier therein and couples to an external power source for selective rotation of the intensifier and/or the vessel, to mix, agitate, or blend ingredients enclosed within.

3,787,036
HUMIDIFIER
Thomas C. Hastings, 52 Addington St., Willowdale, Ontario, Canada
Filed Apr. 27, 1972, Ser. No. 248,080
Int. Cl. B01f *3/04*
U.S. Cl. 261—29 **8 Claims**



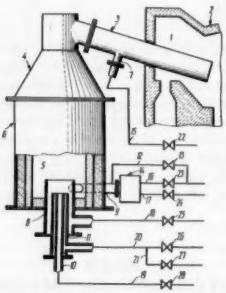
A humidifier comprises a housing defining a water reservoir, the housing providing an air inlet and an air outlet, means for effecting a flow of air through the housing between the air inlet and the air outlet, means cooperating with the reservoir for imparting moisture to the air flow, and baffle means adjacent the air outlet for deflecting the flow of air within the housing, said baffle means providing surfaces positioned to impart a substantially 180° turn in the flow of air before it reaches the air outlet and to intercept water droplets in the deflected air for preventing the droplets from reaching the outlet.

3,787,037
CARBURATION SYSTEM
Motozo Motooka, 7-23, Orihashicho, Sasebo, Japan
Filed June 7, 1971, Ser. No. 150,650
Int. Cl. F02m *23/14*
U.S. Cl. 261—130 **1 Claim**



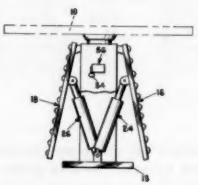
This invention provides a device for use in association with a carburetor and an internal combustion engine. The device comprises: a heater, an air heating means and a means for communicating the hot air with a fuel-air mixture passage leading to a combustion chamber, so that an atmosphere of elevated temperature is obtained in the fuel-air mixture. The liquid fuel tending not to be volatilized by the carburetor is caused to be rapidly vaporized, resulting in fuel economy and avoiding the problem of air contamination by carbon monoxide.

3,787,038
REFORMER FOR FIRING REVERBERATORY FURNACE AND METHOD OF OPERATING SAID REFORMER
Pavel Alexandrovich Tesner, ulitsa Chaplygina, 2, kv. 3; Konstantin Ivanovich Makarov, Khlebozavodskoi proezd, 5, korpus 2, kv. 370; Alexandr Kornilovich Ivanov, ulitsa Raskovoi, 33, kv. 49; Mark Anisimovich Robin, 2, kvertsl, 11, kv. 19; Igor Sergeevich Slavkin, ulitsa, Mira, 9, kv. 10; Alexandr Petrovich Pischulin, Proletarsky prospekt, korpus 1, kv. 30, all of Moscow; Leonid Mikhailovich Pokrass, ulitsa Pionerskaya, 98, Donetsk; Alexandr Markovich Pochtman, ulitsa Prardy, 5, kv. 41v, Kharkov; Felix Isaakovich Sheinfain, ulitsa Postysheva, 120, kv. 18, Donetsk; Evgeny Mikhailovich Kondratiev, prospekt Metallurgov, 107, Donetsk; Grigory Isaevich Moiseevich, ulitsa Postysheva, 122, kv. 54, Donetsk; Igor Ivanovich Osmaga, bulvar Shevchenko, 17, kv. 53, Donetsk, and Georgy Gavrilovich Zhitnik, bulvar Pushkina, 25, kv. 21, Donetsk, all of U.S.S.R.
Division of Ser. No. 103,127, Dec. 31, 1970, abandoned. This application Nov. 7, 1972, Ser. No. 304,307
Claims priority, application U.S.S.R., Jan. 4, 1970, 1391905
Int. Cl. C21c *5/04*
U.S. Cl. 266—24 **4 Claims**



A reformer for firing a reverberatory furnace comprising a reaction chamber with a device for incomplete combustion of the gaseous and liquid hydrocarbon fuel accompanied by the formation of soot which is supplied into the working space of the furnace for ensuring a high luminosity of the flame.

3,787,039
PNEUMATIC HOLD DOWN TABLE
Robert G. Zeichman, 2070 Eldon N.E., Grand Rapids, Mich.
Filed Feb. 4, 1972, Ser. No. 223,597
Int. Cl. B25b *11/08;* **B25h** *1/02*
U.S. Cl. 269—13 **12 Claims**



A hold down table for planar work pieces and the like to enable workmen to work completely around the edges of the table and permitting the planar workpiece to be moved into position by sliding along the top of the table. Means, preferably vacuum means, firmly grip and hold the workpiece when in the proper position. The table has a pair of arms which are mounted on a frame to swing upwardly to support the workpiece above the top of the gripping and holding

means. The arms are also mounted for movement downwardly and inwardly to lower the workpiece onto the gripping and holding means. The movement of the arms inwardly permits the worker to move completely about the edge of the workpiece. In the preferred embodiment vacuum is drawn on the holding and gripping means by a venturi. The arms are supported and moved by fluid cylinders which are operated by a valve coupled to a fluid supply source, the valve also controlling the operation of the venturi.

3,787,040

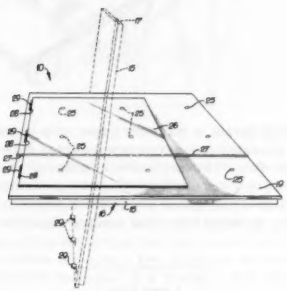
TILTABLE GLASS CUTTER'S TABLE WITH RETRACTABLE SHEET SUPPORTING PEGS

Byron W. Allen, 188 S. "I" St., San Bernardino, Calif.

Filed Nov. 18, 1971, Ser. No. 200,004

Int. Cl. B25b *11/00*

U.S. Cl. 269—58 **5 Claims**



A power actuated tiltable plate glass cutter's table is shown in my U.S. Pat. No. 3,570,733, which is power tiltable between a steeply inclined position in which a heavy sheet of glass is received on said table with the sheet supported on a plurality of pegs provided at the lower edge of the table and a horizontal position in which said sheet is supported by an air floatation system permitting it to be readily shifted horizontally, said table also having a breaker bar mechanism for breaking said sheet into pieces of various size while said sheet rests on the air cushion between it and said table.

Mechanism manually operable from a control station at one end of the table, is provided by the present invention for simultaneously retracting said pegs below the surface of said table after the latter has been tilted to horizontal position and said pegs are no longer required for supporring said sheet of glass, whereby pieces of glass may be readily removed from said table horizontally over the edge of said table equipped with said pegs.

3,787,041

ROTARY FOLDING APPARATUS

Klaus Hertrich, Gohrenz, Germany, assignor to VEB Polygraph Leipzig, Kombinat fuer polygraphische Maschinen u. Ausruestungen, Leipzig, Germany

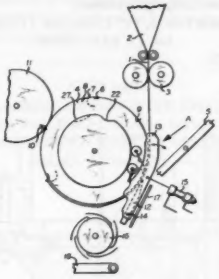
Filed Oct. 18, 1971, Ser. No. 189,847

Int. Cl. B65h *45/16*

U.S. Cl. 270—64 **4 Claims**

A rotary folding apparatus, having cam-controlled puncturing needles on one swing shaft associated with cam-controlled strippers, on another swing shaft.

First roller levers are supported rotatably and connected each via a compression spring to each of the swing shafts, and rigid levers are secured to each of the swing shafts, and bolts connect corresponding of the first roller levers to corresponding of the rigid levers. Second roller levers are firmly connected to the swing shafts and a radially swingable cam segment is disposed operatively in cooperation with the second roller levers.



3,787,042

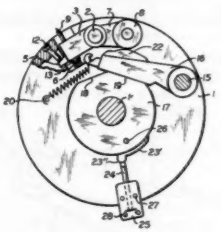
FOLDING APPARATUS FOR WEB-FED ROTARY PRINTING PRESSES

Klaus Hertrich, Gohrenz, Germany, assignor to VEB Polygraph Leipzig, Kombinat fuer polygraphische Maschinen u. Ausruestungen, Leipzig, Germany

Filed Jan. 27, 1971, Ser. No. 110,050

Int. Cl. B65h *45/16*

U.S. Cl. 270—70 **3 Claims**



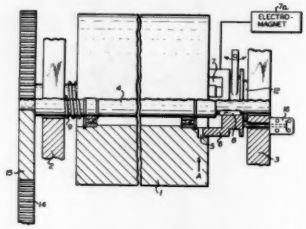
A folding apparatus for web-fed rotating printing presses which comprises a machine wall, folding knives, and one movable folding blade. A fixed folding blade stop is provided. One movable folding blade, operating against the fixed folding blade stop, coordinated to each of the folding knives. A folding knife cylinder, and two double-armed levers. The folding knives are guided under taut spring action and disposed on one of the double levers. One of the levers has a cam roller, which engages temporarily for the duration of the rearward movement of the cylinder a swingable cam segment. A hub is provided and a cam is fastened to the hub and has two surfaces extending at an obtuse angle to each other, and is adapted for fixing the position of the cam segment. A switch for the blocking of a control circuit for at least one of the forward and rearward movements of the folding apparatus is controlled by the cam.

3,787,043

ROTATING FOLDER FOR PRINTING PRESSES

Klaus Hertrich, Gohrenz, Germany, assignor to VEB Polygraph Leipzig, Kombinat fuer polygraphische Maschinen u. Ausruestungen, Leipzig, Germany

Filed Feb. 2, 1971, Ser. No. 111,880
Int. Cl. B65h 45/16
U.S. Cl. 270—71 5 Claims



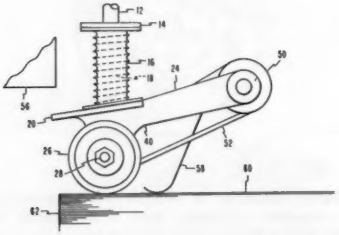
A rotating folder for printing presses in which a movable folding blade operating against a fixed folding blade stop is associated with each folding knife, comprising a folding blade cylinder and a driven shaft between which is arranged a torsion element and a clutch equipped with jaws which are trapezoidal over a part of their length, and a fixed stop is provided to limit the width of opening of the clutch which amounts at most to only two-thirds of the length of the jaws.

3,787,044

DOCUMENT CONTROLLED PICKING AND FEEDING APPARATUS

Cletus E. Lorensen, Rochester, and John A. Peterson, New Brighton, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 21, 1971, Ser. No. 145,668
Int. Cl. B65h 3/08
U.S. Cl. 271—27 4 Claims



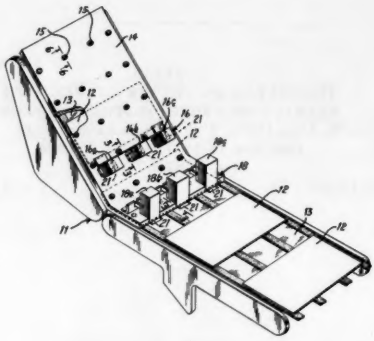
A vacuum actuated document picking and feeding mechanism wherein the document acts as a valve by closing openings in a stationary suction roller thereby causing a document feed cycle to be initiated during which the document is initially lifted and thereafter driven until the document is delivered from suction roller contact. Uncovering the vacuum openings in the suction roller acts to discontinue the driving connection with the drive mechanism and permit restoration of the roller assembly to an initial position thereby also permitting use of a feedback function.

3,787,045

APPARATUS FOR CONTROLLING MOVEMENT OF OBJECTS

Solomon Stoller, West Hartford, Conn., assignor to The Prudential Insurance Company of America and Randolph Computer Corporation

Filed June 15, 1972, Ser. No. 263,001
Int. Cl. B65h 9/06
U.S. Cl. 271—60 10 Claims



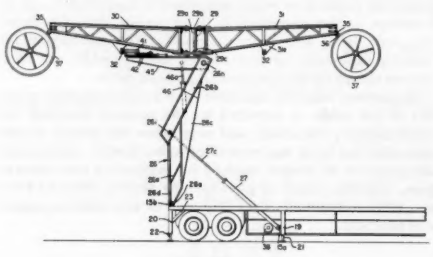
As described herein, a magnetic paper stop includes a relatively freely mounted roller armature mounted in the direction of document flow. The armature is adapted to be driven against and away from a solid surface by an associated solenoid to provide a controlled alignment barrier for the documents passing between the roller armature and the solid surface.

3,787,046

CARROUSEL-TYPE AMUSEMENT DEVICE

Chesley D. Clem, Staunton, Va., assignor to Virginia Amusement Company, Staunton, Va.

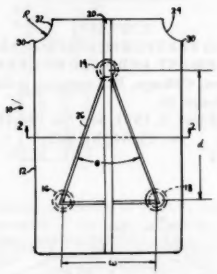
Filed May 12, 1972, Ser. No. 252,602
Int. Cl. A63g 1/08
U.S. Cl. 272—29 9 Claims



A collapsible and portable, over-the-road carrousel having when in assembly, a plurality of passenger-carrying gondolas mounted from a rotatable sweep assembly, wherein an hydraulically powered elevator, with included linkage, is so mounted from and upon a portable platform, which platform serves as a vehicle trailer in over-the-road transport and in assembly serves as a base, as to raise and lower, within wide and predetermined limits, the sweep assembly whether or not the latter be in rotation, through continuously variable relation of the sweep assembly both as to its vertical height above platform and as to its angular attitude with respect to either the vertical or horizontal and which elevator, when desired and

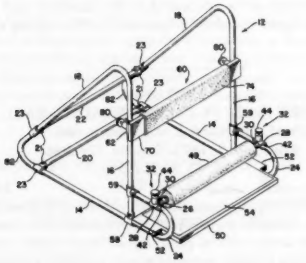
through its included linkage, will so position the sweep assembly as to permit simultaneous loading and unloading of all of the passenger-carrying gondolas, the hydraulic powering for the elevator being such that changes in the vertical height and angular attitude of the sweep assembly as well as changes in the rotational speed of the latter, can all be accomplished independently of each other.

3,787,047
SKI MOTION SIMULATING TRAINING DEVICE
Darrell S. Brawn, 18,849 Flamingo, Livonia, Mich.
Filed Oct. 15, 1971, Ser. No. 189,519
Int. Cl. A63b *23/04*
U.S. Cl. 272—57 B **8 Claims**



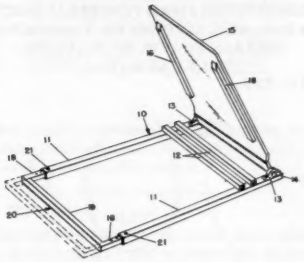
A device is described which simulates the reaction of skis in snow when a user executes thereon the proper skiing motions involved in the wedeln style of skiing, to thereby enable the user to perfect his wedeln form as well as to condition the muscles necessary for proper and easy execution of this skiing style. The device includes a low platform mounted on three bearing elements arranged in a triangle, with the configuration, dimensions, etc., of these elements and the platform such that unweighting, torsional, and angulating movement of the user standing on the platform result in a reaction of the platform simulating that of the skis in snow.

3,787,048
EXERCISE DEVICE
Wallace O. Bock, 26606 Wolf Rd., Bay Village, Ohio
Filed Feb. 24, 1969, Ser. No. 801,498
Int. Cl. A63b *23/02*, *23/04*
U.S. Cl. 272—57 R **1 Claim**



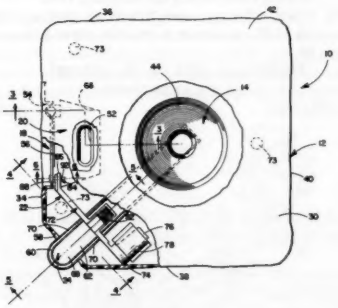
An exercise device which includes a pair of side frames extending substantially vertical in parallel position and held in relatively fixed position by cross members. An extension projects from one end of each side frame and a padded horizontally disposed bar is adjustably fixed between said extensions and is adapted to engage the front of the leg of an exerciser at approximately the height of his ankle. A padded leg support member adapted to engage the back of an exerciser's leg at about his calf extends between the side frames above the bar and is vertically movable on the side frames to accommodate movements of the exerciser.

3,787,049
ATHLETIC TRAINING FRAME WITH PIVOTED BOARD
Oscar A. Rellinger, P.O. Box 12, Helena, Ohio
Filed Nov. 3, 1971, Ser. No. 195,097
Int. Cl. A63b *21/00*
U.S. Cl. 272—58 **3 Claims**



This invention is an athletic training and exercising device consisting of a horizontally disposed rectangular frame which is adjustable in length, and to one end of which is hingedly attached a rectangular board of the same width as said frame but somewhat shorter in length. The exercising procedure consists of placing the device upon the floor or ground and lying down upon it, face up, with the head towards the hinged end of said frame and feet braced against the extendable end of said frame; then, by taking hold of the free end of said board with both hands, lifting ones self to an upright position.

3,787,050
REACTION GAME SIMULATING RELEASE OF TREASURE
Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif.
Filed Jan. 31, 1972, Ser. No. 222,122
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 R **4 Claims**



A housing is provided with a receptacle for the treasure. An opening in the housing allows deposit of treasure items into the housing and a door in the housing allows removal of the treasure. The door is normally latched shut but is unlatched by

a ball operated pivoted arm. The housing includes a funnel shaped receptacle for the receipt of individually marked player balls. The funnel allows deposit of all the balls simultaneously but because of its shape permits exit of only one ball at a time. As the balls exit the funnel they travel down an inclined chute. The pivoted arm overlies the chute and is caused to pivot by a ball wedging it upwardly and thus unlatching the door. The end of the chute extends out of the housing whereby the players may see which ball was the first one down the chute and thus unlatch the door. A stack of cards are provided bearing various instructions for the players of the game to either deposit treasure tokens in the receptacle or deposit their balls in the funnel. The cards are drawn one at a time by the players.

3,787,051

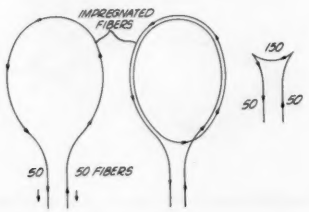
CONTINUOUS FIBER TENNIS RACQUET

Henry Van Dyke Johns, 314 Oriole Rd., Pasadena, Calif.

Filed Aug. 28, 1970, Ser. No. 67,882

Int. Cl. A63b 49/10

U.S. Cl. 273—73 F **3 Claims**



A tennis racquet composed entirely, except for the strings and a leather handle cover, of resin impregnated glass fibres approximately 25 percent of which extend unbrokenly up one handle, around the bow including the throat, around the head and down the other handle, approximately 50 percent of which extend up one handle around the head and then down the other handle, and approximately 25 percent of which extend up one handle member, across the throat and then down the other handle member. Short fibres are positioned across the throat to make the throat contain a number of fibres equal to that of any other portion of the racquet.

3,787,052

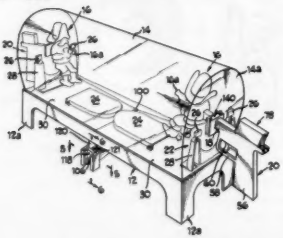
PROJECTOR AND TARGET APPARATUS INCLUDING PROJECTILE COLLECTING CLIP WHICH IS ALSO A MAGAZINE FOR THE PROJECTOR

Marvin I. Glass, Chicago, and Robert S. McKay, Morton Grove, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 1, 1972, Ser. No. 230,585

Int. Cl. A63b 71/00

U.S. Cl. 273—101 **10 Claims**



A skill type target game which includes two opposing launching areas each having target means alongside a selectively operable launching device for propelling objects therefrom through the air toward the target means at the opposite launching area. A movable blocking panel is operatively associated with each of the targets to effectively block the propelling of objects from the adjacent launching device in response to the respective target being struck by one of the objects propelled from the opposite launching device. The launching devices are formed in the shape of cowboys holding guns to simulate a Western "shoot-out." Clips are provided for the guns to hold a plurality of spherical projectiles. The target areas have floors inclined downwardly to a storage compartment for propelled projectiles, the storage compartment having movable door means for delivering projectiles from the compartment to the clips automatically as the clips are interengaged with the compartment.

3,787,053

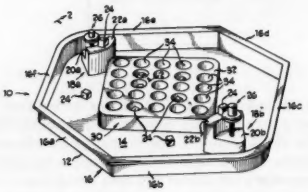
LAUNCHING PLATFORM, SPRING LAUNCHING ELEMENT AND TARGET AREA

Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 5, 1971, Ser. No. 196,114

Int. Cl. A63b 71/02

U.S. Cl. 273—101 **2 Claims**



A launching type target game including a multi-compartmented board with the compartments arranged in regular rows, and launching platforms with launching elements spaced from said game board, and plural playing pieces of a size and shape to be launched by said launching elements and received in the compartments of said game board. The launching platforms have raised arcuate shoulders defining a launching surface for supporting a playing piece. The launching members are mounted adjacent the platforms for movement between a cocked or stressed position remote from the platforms and a released or launched position which extends through the space above the platform. Each launching element includes a spring connected at its lower end to the platform and having an enlarged riged member connected at the spring's upper end.

3,787,054

HIDDEN MAZE PUZZLE CONTAINED BALL

David C. Stafford, 212 North E St., Marion, Ind.

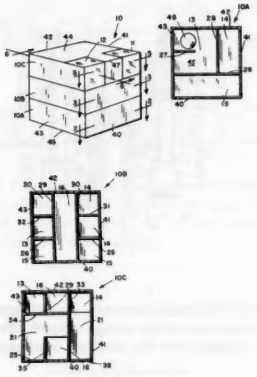
Filed Jan. 7, 1972, Ser. No. 216,056

Int. Cl. A63f 7/00

U.S. Cl. 273—109 **2 Claims**

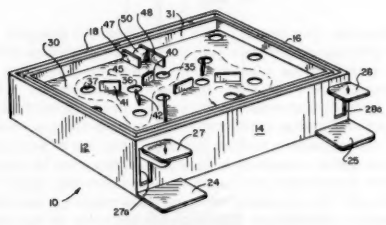
A puzzle having a maze through which a contained ball traverses. A cubicle main body is provided with nontransparent outer walls with a plurality of inner walls mounted therein defining a single noncontinuous tortuous passage having a start and finish without any dead end passages. A pair of transparent windows mounted to the outer walls of the main body are positioned at the start and finish of the passage. A ball is positioned within the main body and is movable from the start window through the passage to the finish window. The ball is unremovable from the main body. In one embodiment, the inner walls are nontransparent thereby preventing

visual determination through the windows of the tortuous passage. In another embodiment, some of the inner walls are



transparent allowing a person to visually determine through the windows a portion of the tortuous passage. In another embodiment, all of the inner walls are transparent.

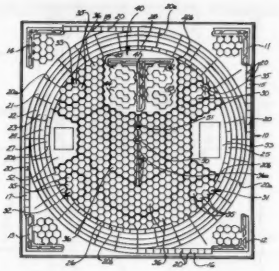
3,787,055
TILT BOARD GAME
Sandy F. Kraemer, 430 N. Tejon St., Colorado Springs, Colo.
Filed July 27, 1972, Ser. No. 275,485
Int. Cl. A63f *7/16*
U.S. Cl. 273—110 **3 Claims**



A tilt board game having a frame, a tiltable playing board pivoted at a single point centrally of one side of the frame, and spring supported on the opposite side, a plurality of barriers on the playing surface for guiding a ball, and a plurality of holes each with point values spaced around the playing board.

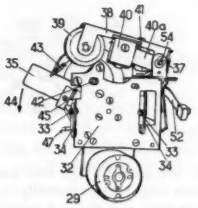
3,787,056
AIRCRAFT TRAFFIC CONTROL BOARD GAME APPARATUS
Richard L. Hellmann, 112 Varsity Ct., Crestview Hills, Ky.
Filed Nov. 26, 1971, Ser. No. 202,402
Int. Cl. A63f *3/00*
U.S. Cl. 273—134 C **4 Claims**

A game device for simulating aircraft traffic control procedures between departure airports and a destination airport, comprising a game board having delineated thereon simulated departure terminals, playing spaces connecting said terminals with concentric flight routes, playing spaces within said flight routes, and a simulated destination airport; a plurality of playing pieces simulating aircraft; means to determine by chance the extent of movement of the playing pieces on the game board; and means to determine by chance simulated



take-off and landing clearances for the playing pieces. The game provides entertainment and an introduction to fundamental rules of aircraft traffic control.

3,787,057
TAPE RECORDER UTILIZING RESILIENT TAPE AND CARTRIDGE HAVING NO MOVING PARTS
Serge Cailliot, 16 Avenue Hache, Paris, France
Filed Mar. 30, 1970, Ser. No. 23,745
Claims priority, application France, Mar. 31, 1969, 6909731
Int. Cl. G11b *5/00*
U.S. Cl. 274—4 B **13 Claims**

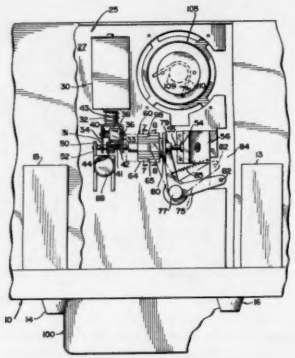


Tape recorder comprising a cartridge within which an endless resilient tape is coiled about a stationary post, and a main assembly comprising a driving spindle, pressure roller, a magnetic head, and means for urging said pressure roller and head against said tape, and thereby pressing said tape against said driving spindle.

3,787,058
MAGNETIC TAPE REPRODUCING DEVICE
Charles E. Lyon, Jr., Des Plaines, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Continuation of Ser. No. 487,996, Sept. 17, 1965, abandoned.
This application Nov. 10, 1971, Ser. No. 197,507
Int. Cl. G11b *21/08, 23/04*
U.S. Cl. 274—4 G **17 Claims**

This invention pertains to cartridge tape players and more particularly to the automatic positioning of the magnetic tape head of a cartridge type tape player that is adapted to receive and play multi-track tape cartridges of different kinds which have tapes with different numbers of tracks. Automatic opera-

tion means also include a cartridge sensing means for identifying four track and eight track cartridges and a head actuating

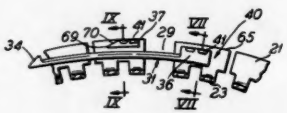


means including a pair of coaxially mounted cams for shifting said magnetic head according to the type of cartridge sensed.

3,787,059
PISTON RING END GUIDE

Harold E. McCormick, Ballwin, Mo., assignor to Ramsey Corporation, St. Louis, Mo.

Filed Aug. 14, 1972, Ser. No. 280,657
Int. Cl. F16j *9/18*
U.S. Cl. 277—1 **11 Claims**



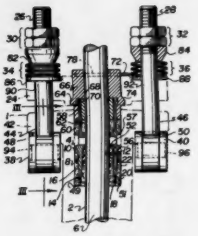
An end guide for piston rings and particularly circumferential expansion rings of substantially U-shaped cross section. The rings are split and the end guide functions to align the split ends. The end guide consists of a first member having a head thereon and a projecting lance member. The head is dimensioned to be snugly received between opposed radially extending legs of the ring in a press-fit relation on one side of the gap with the lance crossing the gap and extending between the legs of the ring on the other side of the gap. A second member is press-fit between the legs on the opposite side of the gap from the head and prevents exit of the end of the lance from that side of the gap. The first and second members are attached together at the time of installation of the end guide into the ring.

3,787,060
VALVE STEM PACKING ASSEMBLY

Cyril J. Astill, Deep River, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed July 24, 1972, Ser. No. 274,733
Claims priority, application Canada, Nov. 12, 1971, 127509
Int. Cl. F16j *15/00;* **B65d** *53/00*
U.S. Cl. 277—69 **4 Claims**

A valve stem assembly wherein a wedge-shaped sleeve is pushed between packings, sealing a valve stem in a valve housing, by clamping nuts and bolts compressing Belleville washers and cams applying further compression to the Belleville washers. The valve stem is actuated by temporarily releasing

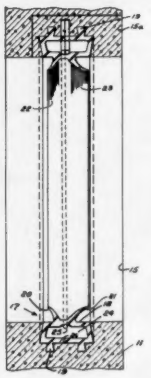


the cams. Preferably outer secondary packing is provided on a cylindrical extension of the wedge-shaped sleeve to trap any fluid which escapes when the cams are temporarily released.

3,787,061
ELASTOMERIC SEAL

Ronald E. Yoakum R.R. 1, Union, Ohio

Filed May 17, 1971, Ser. No. 143,922
Int. Cl. F16j *15/32*
U.S. Cl. 277—164 **5 Claims**



A seal for making leakproof, durable and adjustable telescoping connections for piping and the like comprises a generally cylindrical body portion of flexible elastomeric material having a pair of ribs extending inwardly and toward opposite ends of the body portion, which ribs are releasably biased inwardly and are adapted to be flattened into sealing engagement with the outer surface of a pipe or the like.

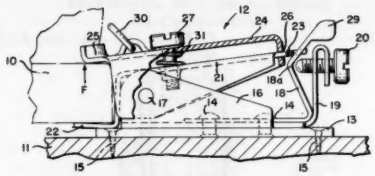
3,787,062
SAFETY STEP-IN HEEL BINDING FOR SKIS

John D. Kusianovich, 1829 Sigma Chi Rd., Albuquerque, N. Mex.

Filed Dec. 13, 1971, Ser. No. 207,309
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **6 Claims**

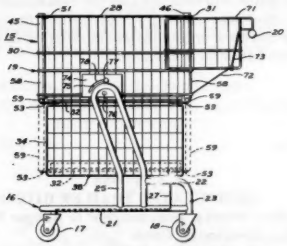
A step-in safety ski heel binding includes a heel holding means engaging the heel of a ski boot, the heel holding means

operatively connected to a linkage or lever arrangement which engages one or more flat or leaf springs. The force of the springs acting against the lever arrangement retains the



heel of the ski boot on the ski and absorbs ordinary skiing shocks without release and releases the ski boot when an upwardly directed force is exerted on the heel-holding means which exceeds the force of the springs.

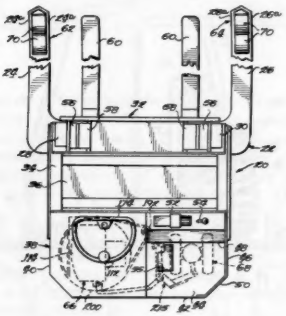
3,787,063
SHOPPING CART OR THE LIKE
Earl J. Oliver, 555 Montague Ave., Fremont, Calif.
Filed Dec. 10, 1970, Ser. No. 96,704
Int. Cl. B62b *11/00*
U.S. Cl. 280—33.99 F **17 Claims**



A shopping cart or the like having a container adapted to receive articles therein, and having also wheels enabling the cart to be propelled along the aisles of a supper market or similar establishment. The cart includes wheel-equipped frame structure having a container supported thereby for selective angular displacements between a generally horizontal position of use and a generally vertical position in which a plurality of carts can be disposed in successive juxtaposition with frame and container portions of one cart nested within frame and container portions of an adjacent cart. The container has a movable bottom wall displaceable between retracted and extended positions in accordance with the magnitude of the weight supported at any time by the bottom wall, thereby making the chamber defined by the container automatically expandable to accommodate the size of the load placed therein by a shopper, and automatically retractable as such load is removed therefrom to facilitate unloading of the chamber at the check out counter of such market. The movable bottom wall is floatingly supported so that it will not bind if subjected to asymmetrical loading.

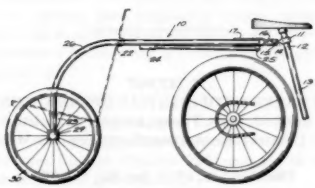
3,787,064
POWER DRIVEN MATERIAL HANDLING TRUCK
Donald Jack De Priester; David C. Horney, both of Muscatine, and Robert H. Mangels, Buffalo, all of Iowa, assignors to Hon Industries Inc., Muscatine, Iowa
Division of Ser. No. 100,191, Dec. 21, 1970, Pat. No. 3,722,613. This application Dec. 15, 1972, Ser. No. 315,639
Int. Cl. B60k *17/30*
U.S. Cl. 280—93 **12 Claims**

Disclosed herein is a material handling truck of the stand-up rider type having four support wheel units, including two steerable support wheel units, one of which comprises a power driven traction wheel. The two steerable wheel units are mounted on a rigid subframe joined to the main frame of the truck for pivotal movement about a longitudinal axis so that the wheels can accommodate to uneven terrain and thereby maintain the traction wheel in effective contact with varying subjacent surfaces. The second steerable wheel unit comprises



a pair of spaced wheels which have independent horizontal tilting movement about a mounting axis spaced below the axis of rotation of these wheels to minimize any tendency of this wheel unit to cock. A telescoping universal drive connects a steering wheel on the vehicle with a sprocket chain on the subframe for steering the traction wheel. An internesting compensating linkage system on the subframe provides positive steering movement of the other steerable wheel unit.

3,787,065
TRAILER FOR BICYCLES
Ronald F. Grimm, 5241 N. 25th St., Milwaukee, Wis.
Filed Aug. 22, 1972, Ser. No. 282,755
Int. Cl. B62k *27/00*
U.S. Cl. 280—204 **4 Claims**



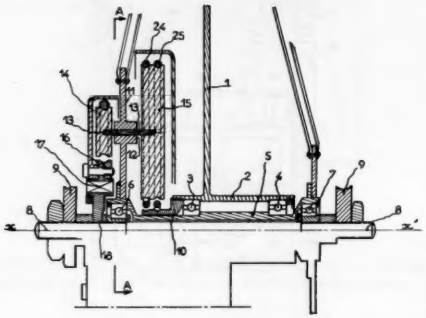
A trailer for a bicycle including a plate affixed to the vertical support for the bicycle seat, a pair of trailing elements attached for limited lateral pivotal movement to said plate, means on the free ends of the trailing elements to dispose a pair of wheels in trailing alignment, and means to releaseably secure said trailing elements in spread trailing position, whereby upon release of said means the trailing elements may be folded into parallel contact for storage.

3,787,066

GYROSCOPIC DEVICE FOR THE STABILIZATION OF LATERALLY UNSTABLE VEHICLES

Claude Hautier, 11 rue du Pavillion, Chinois 44, Nantes, France

Filed Sept. 28, 1971, Ser. No. 184,593
Claims priority, application France, Oct. 1, 1970, 7036476
Int. Cl. B62m 1/10
U.S. Cl. 280—217 5 Claims



The present invention is directed to a gyroscopic device for stabilizing a laterally unstable vehicle which rests on aligned contact points or on a very narrow surface which may be identified with a segment of a line.

The device comprises a gyroscopic disc mounted on a swivelling support. The disc rotates in an oscillating plane according to the orientation of the support and according to the tilt of the vehicle. This plane is substantially parallel with the one passing through the line of the contact points of the vehicle with the travelling surface and the center of gravity of the vehicle. Its axis of rotation can never be parallel with the latter plane. The disc rotates even after the vehicle has stopped. It is rotated either by a wheel actuated by the movement of rolling surface of the vehicle either by an independent motor either by the propulsion motor. After the vehicle has stopped, the disc rotates through its own inertia, due to a free wheel mounted on the transmission. The stability device and the direction system may include a control system.

It is particularly used for cycles, motorized or not, to vehicles sliding on snow or rough ground, to laterally unstable boats.

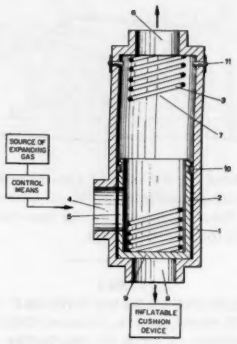
3,787,067

SAFETY VALVE WITH INERTIAL OPENING CONTROL

Jean Paul Bernard, Paris, France, assignor to Societe Anonyme Aerazur Constructions Aeronautiques, Issy-Les-Moulineaux, France

Filed Nov. 18, 1971, Ser. No. 199,997
Claims priority, application France, Nov. 18, 1970, 70.41379
Int. Cl. B60r 21/08
U.S. Cl. 280—150 AB 5 Claims

A safety valve is provided whose opening is controlled by the movement of a piston that responds to an inertial force. The valve includes a tubular body having a discharge opening at one end an evacuation opening at the other end, and a fluid inlet situated in the lateral wall. A piston is slidably arranged within the tubular body so as to close the discharge opening at one end, but to permit communication between the inlet, an evacuation opening at the other end. A compression spring is mounted in the tubular body so as to continually push the piston toward the discharge opening, in order to keep the evacuation opening open. Upon the application of an inertial



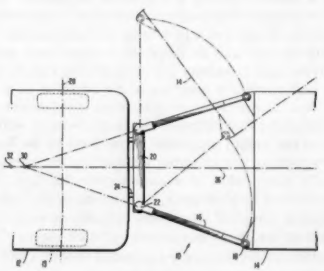
force, the piston will slide towards the evacuation opening and open the discharge opening for permitting the egress of gas. The valve can be arranged for use in inflation devices, such as air bags, for automotive vehicles.

3,787,068

ARTICULATED TRAILER HITCH

Lester Miller, Topeka, Ind., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

Filed Sept. 25, 1972, Ser. No. 292,059
Int. Cl. B60d 1/06
U.S. Cl. 280—446 R 2 Claims

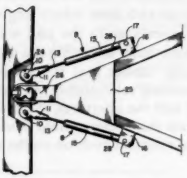


The trailer hitch includes a pair of tongues pivotally connected at opposite ends to a towing vehicle and a towed vehicle, respectively. The tongues are symmetrically arranged on opposite sides of a line coincident with the centerlines of the towing vehicle and the towed vehicle when the latter are longitudinally aligned. The tongues converge forwardly toward one another such that lines coincident with the long axes of the tongues intersect along the centerline of the towing vehicle at a location forwardly of its rear wheel axis and rearwardly of its center of gravity. The foregoing provides an effective hitch pivot point which sustantially reduces the tendency of the vehicles to sway relative to one another.

3,787,069
TRAILER HITCH WITH AUXILIARY SAFETY CONNECTIONS

Edward W. Chauncey, Rt. 1, Box 519, Walker, La.

Filed May 22, 1972, Ser. No. 255,451
Int. Cl. B62d 53/06
U.S. Cl. 280—486 9 Claims

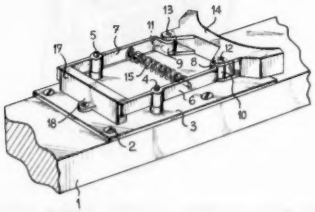


An apparatus for securing a trailer to a towing vehicle comprising at least two connecting means attached to the tongue of the trailer, the connecting means including cylinder means connected to the trailer, spring means located inside the cylinder means, and cable means connecting the spring means to the towing vehicle.

3,787,070
SKI BINDING WITH LATERAL RELEASE

Georges Pierre Joseph Salomon, 34 Ave. de Laverchy, Annecy, France

Filed Feb. 11, 1972, Ser. No. 225,427
Claims priority, application France, Feb. 16, 1971, 7106187
Int. Cl. A63e 9/00
U.S. Cl. 280—11.35 T 6 Claims



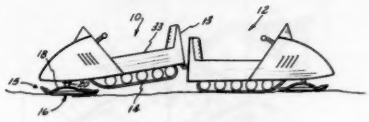
A ski binding intended to ensure retention of a ski boot and the release thereof whenever a predetermined load is applied to the boot laterally in the plane of the ski; it includes a base plate attached to the ski, a lever mechanism hinged to a vertical axis on the base plate cooperating with a jaw holding the boot and with a stationary stop integral with the base plate, and a resilient means restoring the lever mechanism to a position against the stationary stop. The cooperation between the jaw and the lever mechanism is achieved by means of a system of axes and guide ramps ensuring release of the binding by means of relative movement between the jaw and the lever mechanism.

3,787,071
TOWING SKI ATTACHMENT FOR SNOWMOBILES AND METHOD OF USING SAME

Edward H. Jagel, 3629 Lippencott, Flint, Mich., and Joseph R. Purzycki, 4396 Eleanor, Linden, Mich.

Filed May 7, 1971, Ser. No. 141,132
Int. Cl. B62b 17/02
U.S. Cl. 280—28 5 Claims

A towing ski for attachment to the skis of snowmobiles and similar vehicles designed for travel over snow so as to facilitate the towing of an inoperative snowmobile in a rearward direction. Each towing ski comprises a ski member having a straight portion and a generally upwardly curved forward end. A stop member is carried on the upper face of the ski member and projects toward the rear end thereof. The rear portion of the snowmobile ski is adapted to be fitted onto the straight

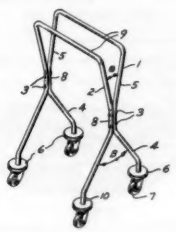


portion of the ski member with the stop member providing a means for preventing the snowmobile ski from overriding the forward curved end of the towing ski when the snowmobile is being towed rearwardly. Means are provided on the towing ski to prevent lateral movement of the snowmobile ski with respect to the longitudinal axis of the towing ski.

3,787,072
LAUNDRY HAMPER STAND

Harry F. DeBoer, Lansing, Ill., and Joseph A. N. Spowart, Hammond, Ind., assignors to Servicemaster Hospital Corporation, Downers Grove, Ill.

Filed Nov. 4, 1971, Ser. No. 195,667
Int. Cl. B62d 53/06
U.S. Cl. 280—79.1 5 Claims



A laundry hamper stand suitable for holding, in a stable manner, two laundry bags. The stand comprises two substantially identical front and rear interconnected inverted U-shaped support members, each member having a vertical center arm intermediate each of the legs and the closed end of the inverted U, said legs and closed end being bent outwardly from the vertical arm. The front and rear members are interconnected by joining their respective vertical center arms. The bottom legs extend beyond the closed end to provide a stable base when a laundry bag is placed over the closed end of the support.

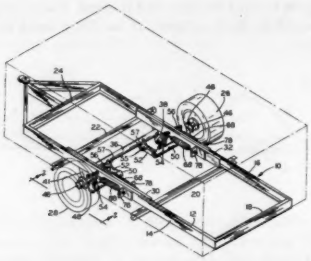
3,787,073
SUSPENSION SYSTEM

Silvano Giuseppe Lievore, Elkhart, Ind., assignor to Elkhart, Bridge & Iron, Inc., Elkhart, Ind.

Filed Dec. 14, 1972, Ser. No. 315,123
Int. Cl. B60g 11/16
U.S. Cl. 280—124 A 8 Claims

A trailer is supported at each side by a vehicle wheel and the vehicle wheel is mounted on a stub axle portion of a shaft, the shaft being transversely supported along its length on the frame side. Each supported section of the shaft is pivotally supported through lugs which are secured to the side of the frame. The said support for the shaft includes two bellcrank levers one disposed at each side of the frame siderail and having a spring connection which yieldably opposes movement of

the wheel in a vertical direction. The wheel is thus cushioned. The wheel is supported against turning except vertically and rotatably. Other movements relative to the frame are resisted



by reason of the support for the shaft which is provided at spaced points along the length thereof. Thus, the wheel is stably mounted.

3,787,074

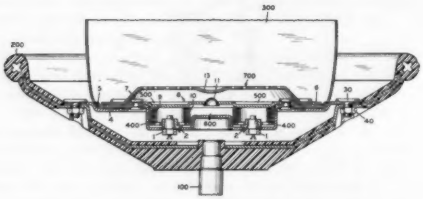
MULTIPLE PYRO SYSTEM

Donald J. Lewis, Troy, and Robert L. Stephenson, Sterling Heights, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 28, 1971, Ser. No. 147,913

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **3 Claims**



This invention relates to the procedure of redundancy, without operational compromise, in the supply of generated gas from a pyrotechnic device to an inflatible bag assembly.

3,787,075

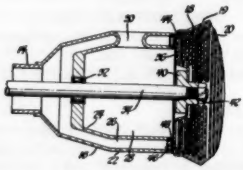
STEERING WHEEL AND COLUMN INTERFACE SEAL

Philip L. Francis, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1972, Ser. No. 302,043

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **5 Claims**



The housing at the upper end of a motor vehicle steering column indicates radially spaced inner and outer walls which define a plenum communicating with an inflator. An interface seal is mounted in the plenum at its end portion adjacent the steering wheel and includes an annular rubber seal of channel cross section having received therein an annular reinforcement and being located in axially spaced relation from the end wall of the steering wheel to permit frictionless rotation of the steering wheel relative the housing. Upon communication of pressure fluid to the plenum, the interface seal is slidably moved axially into engagement with the end wall of the steering wheel. The reinforcement of the interface seal has circumferentially spaced curved slots which register with circumferentially spaced apertures in the end wall of the steering wheel. Upon pressure build up within the annular passage, the bight of the annular rubber seal is ruptured at its portions which are in registering relationship with the curved slots of the reinforcement and the apertures of the steering wheel end wall to communicate the pressure fluid from the plenum to an inflatable occupant restraint cushion on the steering wheel.

3,787,076

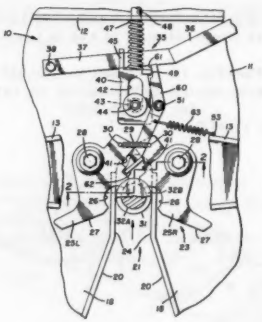
FIFTH WHEEL COUPLER ASSEMBLY

William D. Walther, Dayton, and Robert A. Deregnaucourt, Centerville, both of Ohio, assignors to The Dayton Steel Foundry Company, Dayton, Ohio

Filed Apr. 11, 1972, Ser. No. 242,948

Int. Cl. B62d *53/12*

U.S. Cl. 280—435 **1 Claim**



A fifth wheel coupler assembly having dual opposed coupling jaws pivotally mounted beneath the top plate on opposite sides of the kingpin slot. A latch mechanism is carried beneath the top plate and includes a plunger block movable longitudinally of the kingpin slot and spring-biased so as to be inserted between opposed and parallel faces on the forward end of the dual coupling jaws to lock the jaws in a kingpin engaging position. A sensor arm projects into the slot when the assembly is in open or kingpin receiving condition and has an orientation such that the plunger block will not release if the kingpin is in a position so as not to correctly engage with the coupling jaws.

3,787,077

ANTI-SWAY BAR

Louis J. Sanders, 418 S. Smith St., Aurora, Ill.

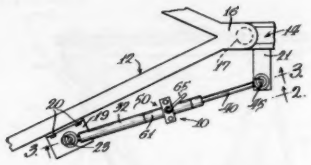
Filed Mar. 2, 1973, Ser. No. 337,453

Int. Cl. B60d *1/14*

U.S. Cl. 280—446 B **6 Claims**

An anti-sway bar mechanism for a trailer driven by automobile or truck including first and second pivotal connections on the trailer and driving vehicle, respectively, a split cylindrical member extending from the trailer pivotal connection and a rod telescoping in the cylindrical member and extending from the other pivotal connection, there being provided an arcuate pressure plate which is actuated by a flat actuator or clamping

plate to press the split cylindrical member and an associated frictional element into engagement with the rod member to vary the clamping force on the rod member and provide variable resistance to sway, there also being provided an actuating member for the arcuate pressure plate that is threaded into the actuating plate and spring biased to a retracted position, the



actuating plate being held in position by a plate on the opposite side of the pressure plate connected to the bottom of the split cylindrical member that has threaded members connected to the actuating plate with the actuating plate and the bottom plate being urged apart to urge the pressure plate to its non-pressure position to assist in releasing the anti-sway pressure on the rod member.

3,787,078

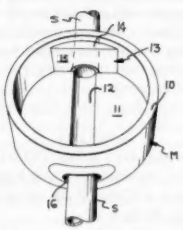
MANHOLE BASE SECTION FOR SEWER LINES

Richard L. Williams, Rt. No. 1, Harrod, Ohio

Filed Aug. 3, 1972, Ser. No. 277,558

Int. Cl. F16l *39/04*

U.S. Cl. 285—189 **1 Claim**



A manhole base section for sewer lines having reinforcing sections on the inside of the base section at opposite ends of the flow channel. Each reinforcing section is of substantial thickness, but the outer side conforms to the outer side of the base section. In each reinforcing section is an inwardly tapered hole aligned with the channel. The sewer pipe for each tapered hole has on its inner end an elastomeric band equipped with tongue-like resilient flexible flanges, which, when crowded into a tapered hole, provide a fluid-tight seal and enable deflection or tilting of the sewer pipe to a limited extent in any direction.

3,787,079

SEALING CONNECTION FOR CONDUIT COUPLINGS

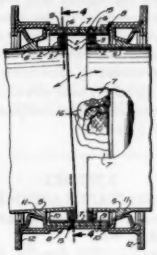
Roy E. Yorke, Granada Hills, and Fred A. Greenwald, Burbank, both of Calif., assignors to General Connectors Corporation, Burbank, Calif.

Filed Apr. 13, 1972, Ser. No. 243,829

Int. Cl. F16l *21/02*

U.S. Cl. 285—233 **1 Claim**

A sealing connection for a pair of conduits wherein each conduit is provided with a radially outwardly directed seal ring receiving channel at its extremity in confronting relation to the other conduit. A cylindrical connector band extends between the seal rings and is confronted by a cylindrical housing, which extends thereover and is joined by a pair of pivotal connections to the two conduits to resist separation but permit limited relative angular movement. An elastomeric ring is



disposed between the connector band and overlying housing to minimize angular movement or radial displacement of the connector band relative to the housing, thereby preventing excess clearance between the connector and thus prevent a seal ring against extrusion from its channel.

3,787,080

PIPE COUPLINGS

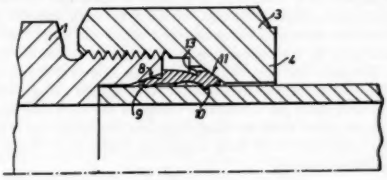
Brian Percy Daniel, 5, The Pagoda, Maidenhead; Berkshire, England

Filed Jan. 25, 1972, Ser. No. 220,634

Claims priority, application Great Britain, May 20, 1971, 16120/71; Jan. 26, 1971, 3178/71

Int. Cl. F16l *17/00*

U.S. Cl. 285—341 **2 Claims**



A compression type pipe coupling in which the ring is formed with a front annular cutting tooth which cuts into the pipe surface on initial tightening of the nut, and is then stopped against further forward movement, further nut tightening resulting in the ring bowing to cause a rear annular cutting to enter the pipe surface, the ring also having an annular cavity between said teeth.

3,787,081

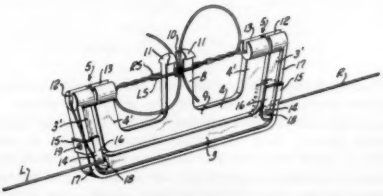
BARREL KNOT TYING DEVICE

Carl L. Macy, 2708 N. 84th St., Milwaukee, Wis.

Filed June 8, 1972, Ser. No. 260,820

Int. Cl. D03j *3/00*

U.S. Cl. 289—17 **9 Claims**



A knot typing device consisting of complementary inner and outer U-shaped plastic moldings, connected for relative

rotation about an axis passing through the distal portions of their arms, the inner U-shaped member having an integral post between and in alignment with its spaced arms to lie between parallel stretches of a pair of lines that approach one another from opposite ends of the device and are laid into communicating slots in the extremities of the arms of both U-shaped members so that upon relative rotation of the two U-shaped members while said stretches of the lines are at opposite sides of the post and are held taut by anchoring the ends thereof to the outer U-shaped member, said stretches are wound upon one another in preparation for the completion of a barrel knot tying said pair of lines together.

3,787,082

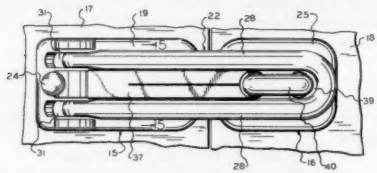
HASP AND STAPLE ASSEMBLAGE

Daniel J. Foote, Wauwatosa, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Filed May 22, 1972, Ser. No. 255,540

Int. Cl. E05c *19/08*

U.S. Cl. 292—281 **4 Claims**



The hasp plate has swingably associated therewith the inner end portion of a novel type of strap of shackle-like formation with the extremities of its legs extending through slots therefor in the hasp plate and being engaged below the under-surface of the plate by a recess-accommodated, non-accessible hinge pin. Similarly the legs of the staple eye extend through slots therefor in the staple plate and are held against withdrawal by a non-accessible pin seated in a recess in the under-surface of the staple plate. Both the hasp strap and the staple eye may be easily assembled with their respective plates in a simple and expeditious manner.

3,787,083

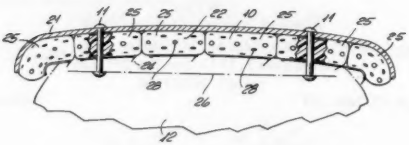
SAFETY VEHICLE BUMPER

Jack Perlberg, Forest Hills, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 6, 1972, Ser. No. 260,322

Int. Cl. B60r *19/08*

U.S. Cl. 293—88 **1 Claim**



A safety bumper for automotive vehicles with energy absorption properties to minimize the shock of collision. The bumper consists of a metal facing which is backed by blocks of foamed plastic, such as polyurethane, encased in porous plastic or fabric sheeting. For installation, on the front and on the rear of existing automobiles, the present metal bumper is retained as the metal facing, and the plastic foam formed in place, or affixed by means of adhesive to fill the space between the existing bumper and the front or the rear of the automobile body.

3,787,084

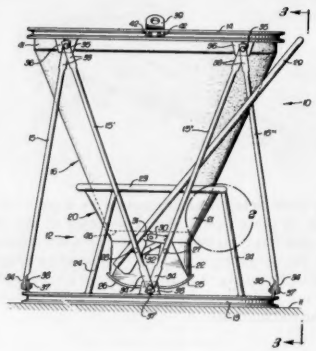
RUBBER CONE CONCRETE BUCKET

Leslie H. Garlinghouse, 1585 Sierra Madre Villa, Pasadena, Calif.

Filed Jan. 5, 1972, Ser. No. 215,484

Int. Cl. B66c *3/00*

U.S. Cl. 294—71 **6 Claims**



A concrete bucket structure has a lower rigid assembly including a ring for supporting the structure on the ground. A rigid hopper with an open top is mounted on the ring. Rods are releasably bolted at lower ends to the ring and at upper ends to a second rigid ring thereby supporting the second rigid ring well above the top of the hopper. A rubber cone has the edge of its large open upper end secured to the second rigid ring and its small open lower end hung unattached in the hopper. The upper, rigid ring may be dismantled from the lower rigid assembly by unbolting and removing the rods, to make a smaller package for shipping.

3,787,085

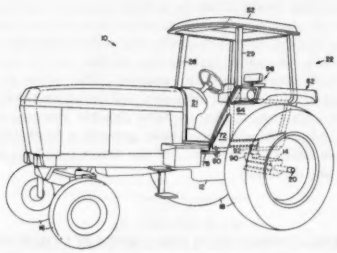
TRACTOR ROLL-OVER PROTECTIVE FRAME

David Hoffer Bucher, Bettendorf; Craig Eugene Christie; Don J. Rasmussen, both of Cedar Falls, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed June 23, 1972, Ser. No. 265,779

Int. Cl. B62d *27/04*

U.S. Cl. 296—28 C **11 Claims**



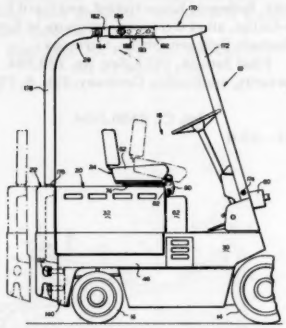
A tractor roll-over protective frame includes front and rear pairs of upright support members which form the corners of a box-like framework. A canopy is supported at the top of the framework and fenders are integral with the opposite sides of the framework. The framework also supports an operator's seat, at its back side, and supports the floor of the operator's station.

3,787,086

ADJUSTABLE SEAT FOR AN INDUSTRIAL VEHICLE

Henry L. Cosby, Hickory Corners, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 34,713, May 5, 1970, Pat. No. 3,687,484.
This application Nov. 8, 1971, Ser. No. 196,648
Int. Cl. B60n *1/02*
U.S. Cl. 296—65 R 10 Claims



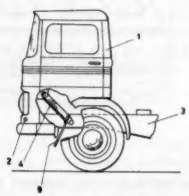
A lift truck is shown to exemplify the invention in which a seat support member is pivoted at one side to allow the seat to be swung outwardly of one side of the truck from a forwardly facing operative position for operating the vehicle to a rearwardly facing non-operative position relative to a compartment housing the power source apparatus, such as an electric storage battery. A protective overhead guard device includes one pivotable and longitudinally adjustable connector and one longitudinally adjustable connector for adjusting the length of the guard for connection to a longitudinally adjustable and novel counterweight structure at different adjusted positions thereof, thereby enabling the same truck chassis to be utilized for a relatively wide range of lift truck capacities. In addition, the pivoted connector is adapted to provide an opening in the guard structure through which may pass a chain or cable of a lifting and transfer device which, with the pivoted seat structure, provides simple means for performing an efficient method of removing and replacing the power source or other devices without removing or disassembling the overhead guard or seat structure.

3,787,087

VEHICLE HAVING TILTABLE CABIN AND ACTUATING DEVICE THEREFOR

Pieter Buys, Hengelo-O, and Lambertus Sonneborn, Oldenzaal, both of Netherlands, assignors to Applied Power Industries, Inc., Milwaukee, Wis.

Filed May 1, 1972, Ser. No. 249,352
Claims priority, application Netherlands, Aug. 31, 1971, 7111991
Int. Cl. B62d *27/06*
U.S. Cl. 296—28 C 6 Claims



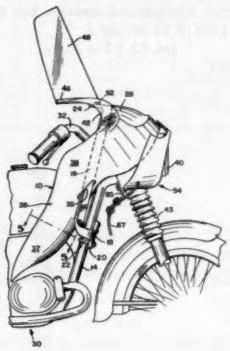
A vehicle such as a truck having a cabin which is pivoted about a horizontal, transverse axis, and hydraulically operated means for tilting the cabin. The hydraulically operated means has an integral hand operated pump which is arranged and positioned to provide a simple, efficient and easily operated device.

3,787,088

MOTORCYCLE FAIRING

Floyd H. Dreyer, Sr., 4164 W. Washington, Indianapolis, Ind.

Filed Nov. 29, 1972, Ser. No. 310,251
Int. Cl. B62j *17/02*
U.S. Cl. 296—78.1 9 Claims



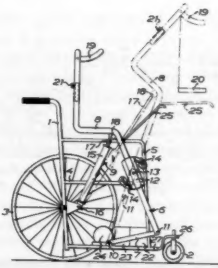
A motorcycle fairing in which a generally U-shaped yoke is mounted on a motorcycle frame. A shield is mounted on said yoke and includes a pair of laterally spaced leg panels interconnected at their upper ends by a transverse top panel. The top panel has a recess at its forward end through which the motorcycle fork and the headlight and its mounting brackets extend. A windscreen is mounted along the rearward edge of said panel. A shell having an opening through which the headlight projects extends across the recess in the top panel and is connected to the headlight bracket for movement with the motorcycle fork. And a mud guard is mounted on said fork below said shell and forwardly of said leg panels.

3,787,089

REHABILITATING CHAIRS FOR HANDICAPPED PERSONS

Karl Edvin Sixten Wrethander, Kallreda Sjukhem 360 40, Rottne, Sweden

Filed July 6, 1971, Ser. No. 159,830
Claims priority, application Sweden, July 6, 1970, 9327/70
Int. Cl. A61h *3/04*; B62b *1/00*
U.S. Cl. 297—118 6 Claims



A rehabilitating chair for handicapped persons, comprising a combination of a wheel chair and a motor-driven lifting

device mounted thereon, said lifting device comprising at least one toggled lifting arm having its lower part pivotally connected to the chair and its upper part slidable in a pivoted sliding attachment on the chair and having at its upper part an armpit support for the patient.

3,787,090

MINERAL MINING INSTALLATIONS

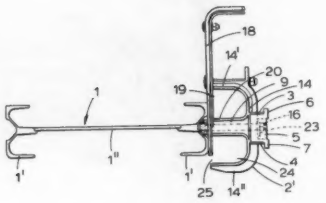
Alois Hauschopp, Werne/Lippe Langem; Oswald Breuer, Dortmund/Husen; Berthold Ostrop, Selm, and Bernd Steinkuhl, Lunen, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed June 28, 1972, Ser. No. 266,919

Claims priority, application Germany, July 5, 1971, P 21 33 262.7; Oct. 8, 1971, P 21 50 228.3

Int. Cl. E21c *35/12*

U.S. Cl. 299—43 **23 Claims**



A mineral mining installation with a multi-section conveyor on which is guided a plough provided with a sword plate. The conveyor channel sections each have two E-shaped members attached to a barrier plate which is in turn connected to the goaf side of the conveyor. A narrow gap is produced between these two members: which members define upper and lower guide passages for a chain used to drive the plough. The sword plate extends through a gap formed between the lower ends of the conveyor and the members. The outer face of each of the members has ribs thereon for connection with shifting rams and the central limb of each member projecting towards the conveyor is of hollow reinforced construction. These webs can be detachable from the remainder of the members.

3,787,091

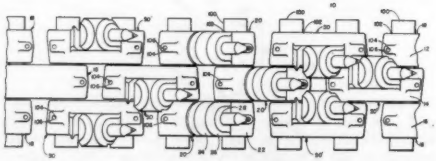
CUTTING CHAIN

Alfred P. Paolini, and Warren E. Fife, both of Columbus, Ohio, assignors to Jeffrey Galion Inc., Columbus, Ohio

Filed May 26, 1972, Ser. No. 257,301

Int. Cl. E21c *25/34*

U.S. Cl. 299—84 **4 Claims**



A chain link for a cutting chain with a boss for supporting a cutter bit. The boss extends laterally beyond the link body and overlies an adjacent chain link in an adjacent row of the chain. The boss is relieved to mate with the adjacent link and to permit articulation of the links relatively to each other. The chain link body and the boss are symmetrical, so that the chain link may be turned for either end of the chain link to be leading in the direction of advance of the chain.

3,787,092

WHEEL WITH DROP-BASE RIM

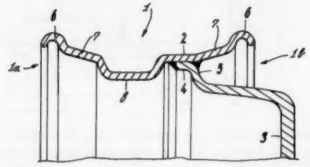
Lorenz Weegen, Langenfeld; Albrecht Luders, Haan; Heinz Brinkmann, Solingen; Klaus Herbst, and Gerd Ernst, both of Solingen-Ohligs, all of Germany, assignors to Kronprinz Aktiengesellschaft, Solingen-Ohligs, Germany

Filed Jan. 26, 1972, Ser. No. 220,794

Claims priority, application Germany, Feb. 5, 1971, P 21 06 381.0—21

Int. Cl. B60b *3/04*

U.S. Cl. 301—63 R **1 Claim**



Wheel for vehicles having a rim element and a wheel disk, the rim being of asymmetrical construction with one narrower and one broader side relative to a dropped base, the broader side having a substantially cylindrical portion, the rim element having flanges bent toward the axis of the wheel; the wheel disk having a peripheral portion of cylindrical configuration that extends axially and matches said cylindrical portion in fitting configuration and being welded thereto.

3,787,093

APPARATUS FOR SEPARATING FIBER FLOCKS FROM A TRANSPORTING AIR STREAM

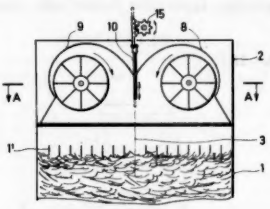
Daniel Hanselmann, Oberwil, and Rudolf Wildbolz, Winterthur, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Oct. 6, 1971, Ser. No. 186,847

Claims priority, application Switzerland, Oct. 12, 1970, 15031/70

Int. Cl. B65g *53/40*

U.S. Cl. 302—61 **16 Claims**



An apparatus for separating opened fiber flocks from a transporting air stream charged with such fiber flocks at a feed chute connected with a pneumatic flock transporting duct wherein the upper part of the feed chute is equipped with at

least two inlet openings for the transporting air stream carrying the fiber flocks. A centrifugal wheel is provided for each such inlet opening.

3,787,094

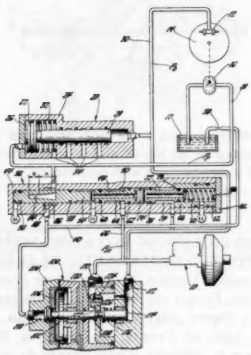
HYDRAULIC ANTI-LOCK BRAKE CONTROL SYSTEM

John L. Harned, Grosse Pointe Woods, and Laird E. Johnston, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 30, 1971, Ser. No. 185,233

Int. Cl. B60t *13/16*

U.S. Cl. 303—10 **1 Claim**



A brake control system includes a pressure operated wheel brake, a master cylinder, a positive displacement pump drivingly connected to the wheel, a brake actuator providing a brake pressure to the wheel brake in proportion to the pump generated pressure, an orifice exhausting the pump generated pressure at a rate which prevents the pump generated pressure from operating the actuator throughout the range of vehicle speeds, and a slip control valve in series connection with the orifice and providing a variable restriction to exhaustion of the pump generated pressure in proportion to the difference between the master cylinder and wheel brake pressures. The flow area presented by the variable restriction of the slip control valve decreases at a decreasing rate as the differential between master and wheel brake pressures increases.

3,787,095

APPARATUS FOR UNLOCKING A BRAKE-LOCKED WHEEL

Alexander Von Loewis of Menar, Post Holzgerlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

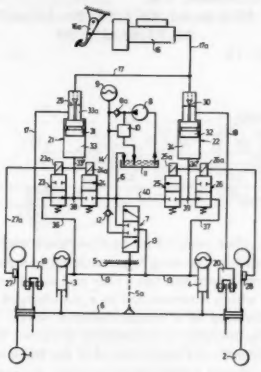
Filed Feb. 13, 1973, Ser. No. 332,168

Claims priority, application Germany, Feb. 22, 1972, P 22 08 182.9

Int. Cl. B60t *8/02*

U.S. Cl. 303—21 F **10 Claims**

A sensor senses the brake-locked condition of a wheel of a motor car, and actuates a control valve to discharge fluid from the cylinder of a brake-unlocking device whose piston operates an unlocking valve in a brake fluid supply conduit so that the supply of brake fluid to the brake is interrupted, while fluid is drawn out of the supply conduit for unlocking the respective wheel. The cylinder of the unlocking device is connected with the hydropneumatic springs supporting the car body on the wheel shaft, so that the unlocking valve is held open even if the pressure of the pump or of the accumulator of the hydropneumatic springs fails.



3,787,096

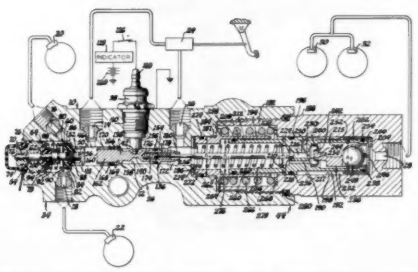
INERTIA VALVE IN A DECELERATION ENERGIZED LOAD CONTROLLED BRAKE VALVE

Ronald L. Shellhause, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 217,542, Jan. 13, 1973, Pat. No. 3,727,987. This application Dec. 5, 1972, Ser. No. 312,335

Int. Cl. B60t *13/06*

U.S. Cl. 303—24 F **1 Claim**



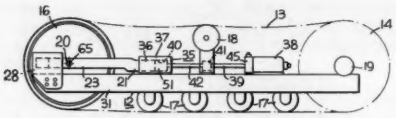
A combination valve assembly for a dual circuit brake system in which a metering valve is in one circuit, a proportioner is in the other circuit, and a hydraulically reset pressure loss warning indicator unit is sensitive to both circuits. The proportioning action rates change to match vehicle loading, to accommodate uphill and downhill grades, and to accommodate any brake fade. This is accomplished providing a deceleration sensing mechanism, including the inertia valve of the invention, which locates the proportioner piston to determine the amount of proportioning required based on the pressure at which deceleration triggers an inertia valve in the proportioner. Actuation of the warning unit because of pressure loss in the metering valve circuit causes the proportioner to be overridden by removing a valve element from a closed position to permit direct flow so that pressure through the proportioner is not proportioned.

3,787,097

TRACK IDLER MOUNT AND RECOIL ADJUSTER

Bobby J. Orr, Springfield, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 7, 1972, Ser. No. 260,631
Int. Cl. B62d *55/30*
U.S. Cl. 305—10 **10 Claims**



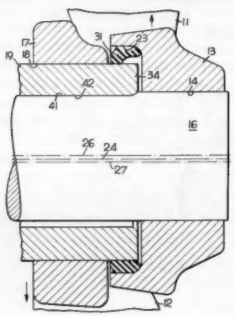
The track idler yoke of an endless track mechanism has a pair of forwardly extending legs mounted in a pair of cylindrical bearing members and has a rear end acted on by a hydraulic actuator which is connected to a gas charged hydraulic accumulator by way of a counterbalance valve. The counterbalance valve includes a differential pressure valve whereby the hydraulic actuator resists recoil of the track idler at a pressure approximately 1,640 pounds per square inch greater than the pressure exerted by the accumulator to return the idler to its normal operating position.

3,787,098

TRACK LINK WITH ECCENTRIC SEAL COUNTERBORE

Bobby J. Orr, Springfield, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 16, 1972, Ser. No. 307,056
Int. Cl. B62d *55/18*
U.S. Cl. 305—11 **4 Claims**



The counterbore of the side bar of an endless track link is formed in eccentric relation to the pin in such a manner that as the usual pin and bushing wear occurs, the eccentricity is reduced. This construction allows the radial seal between the counterbore and bushing to be effective over a greater portion of the wear life of the pin and bushing connection.

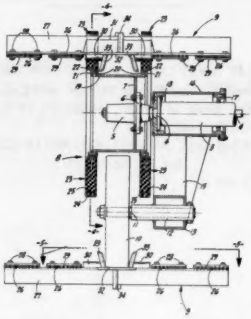
3,787,099

ENDLESS TRACK UNIT

Emmitt M. Tucker, Ashland, and J. Morris Tucker, Medford, both of Oreg., assignors to Tucker & Sons, Sacramento, Calif.

Filed July 24, 1972, Ser. No. 274,737
Int. Cl. B62m *27/02*
U.S. Cl. 305—25 **5 Claims**

An endless track unit for use—in multiple—on an all-terrain vehicle; the unit being substantially triangular in side elevation, and provided with a mount which permits of pivoting of the unit about a transverse axis adjacent the apex of its triangular form; the included endless track being driven by a dual sprocket assembly coaxial with such axis, and such endless track being guided in its lower and working run by a wheel train journaled in connection with said mount.

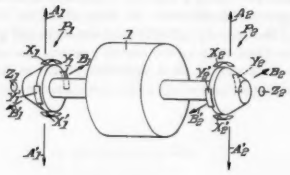


3,787,100

DEVICES INCLUDING ROTATING MEMBERS SUPPORTED BY MAGNETIC BEARINGS

Helmut Habermann, Vernon, France; Roger Loyen, deceased, late of Vernon, France (by Ghislaine Loyen nee Voisen, administratrix); Pierre Joly, Vernon, and Yvan Auber, Rueil Malmaison, both of France, assignors to Etat Francais represente par le Ministre d'Etat charge de la Defense Nationale Delegation Ministerielle pour l'Armement Direction Technique des Engins Laboratoire de Recherches Balistiques et Aerodynamiques, Paris, France

Filed Dec. 11, 1972, Ser. No. 313,679
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 **11 Claims**



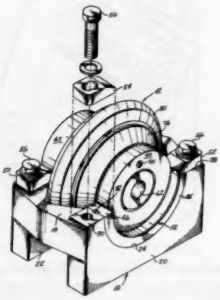
A gyroscope including a rotating member which is supported by a pair of magnetic bearings. Each bearing has two detectors for providing signals representative of the relative position of the member with respect to a common axis of the two bearings along first and second directions perpendicular to the axis and to each other. A feed-back loop controls biasing means in each bearing assembly and includes, for each direction, a summation circuit which sums the signals from the detectors corresponding to that direction in the two bearings and applies correction signals increasing with the summed signals to the biasing means corresponding to the directions in the two bearings. A subtracting circuit subtracts the signals from the detectors corresponding to the considered direction in the two bearings and applied correction signals to the biasing means, but through a polarity inverter in one of the bearings.

3,787,101

ROCK CUTTER ASSEMBLY

David B. Sugden, Tasmania, Australia, assignor to The Robbins Company, Seattle, Wash.

Filed May 1, 1972, Ser. No. 249,364
Int. Cl. F16c 35/00
U.S. Cl. 308—15 10 Claims



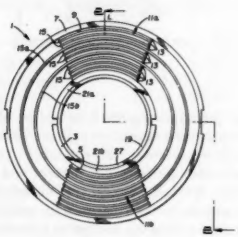
A cutter wheel is mounted for rotation about an elongated support shaft which is interconnected between a pair of relatively large diameter side caps. Base portions of the side caps snugly fit within recesses formed in side members of a mounting frame. The side caps include narrower exposed portions in their extent outwardly of the recesses. Retainer members secured to said side members overhang said recesses to contact and bear against the base portions of the side caps. At least some of the retainer members are detachable from said end members so that they can be removed to permit installation of the side caps into, or removal out from, said recesses.

3,787,102

STABILIZED TUBULAR COMPRESSIVE LOAD CARRYING LAMINATED BEARING

Michael W. Moran, McKean Township, Erie County, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Feb. 5, 1973, Ser. No. 329,945
Int. Cl. F16c 27/06
U.S. Cl. 308—26 9 Claims



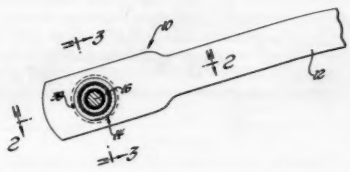
A compressive load carrying laminated bearing comprising concentrically arranged inner and outer tubular bearing support members having disposed and circumferentially spaced therebetween in compressive load transmitting relation separate stacks of radially alternating bonded layers of resilient material and non-extensible material wherein at least one of the layers of non-extensible material is continuous and common to the separate and spaced stacks to provide increased lateral or buckling stability.

3,787,103

UNITARY BUSHING CONSTRUCTION

Robert E. MacMillan, Allentown, Pa., assignor to McCord Corporation, Detroit, Mich.

Filed June 26, 1972, Ser. No. 266,103
Int. Cl. F16c 27/06
U.S. Cl. 308—26 9 Claims



A windshield wiper motion transmitting linkage assembly which includes two links interconnected by a stud. A bushing is supported by one of the links for receiving the stud. The bushing includes a circular attachment means including a groove for receiving the link so as to be attached thereto. The bushing also includes a cylindrical sleeve means having a bore for receiving the stud and an outer surface. There is also included a connection means comprising a web for interconnecting the outer surface of the sleeve means to the connection means whereby the sleeve means is free to cant relative to the attachment means and link.

3,787,104

TWISTED BAR CAGE

Richard L. Alling, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Dec. 29, 1972, Ser. No. 319,854
Int. Cl. F16c 33/30
U.S. Cl. 308—235 6 Claims

A thrust-bearing cage is provided with twisted bars. The smaller width portion of the bar is connected to the inner rim, while the normal bar width is connected to the outer rim. Thus, more rollers can be placed in a cage having a predetermined inside diameter than can be placed in conventional cages having the same inside diameter.

3,787,105

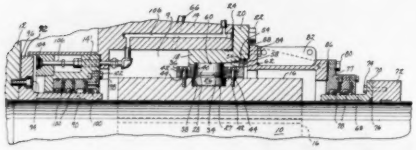
TILTING PAD JOURNAL BEARING

Willis W. Gardner, Waukesha, Wis., assignor to Waukesha Bearing Corporation, Waukesha, Wis.

Filed Dec. 4, 1972, Ser. No. 312,141
Int. Cl. F16c 17/06, 33/74
U.S. Cl. 308—73 10 Claims

A plurality of bearing pads are each tiltably engaged with the interior of a hollow, cylindrical bearing shell in circumferentially-spaced relationship therearound. Relatively hard bearing buttons, one on each pad, and a cooperating one for

each pad on the interior of the bearing shell, are shaped on the adjacent surfaces to provide for tilting engagement between the corresponding pad and the interior of the shell. Each pair of buttons is held in place by a retainer which is removably fastened on one side to the exterior surface of the corresponding pad and is removably fastened on one end to the bearing



shell. An annular flange projecting from the bearing shell is bolted to a supporting structure. The pads and shell are recessed to removably receive their corresponding bearing buttons, and a sloping ramp in the shell for each button guides the button into its recess so that each pad, along with its buttons and retainer, may be easily slid into place as a unit and may be easily removed as a unit.

3,787,106

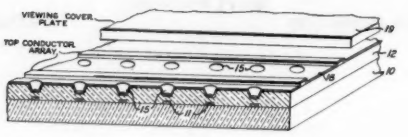
MONOLITHICALLY STRUCTURED GAS DISCHARGE DEVICE AND METHOD OF FABRICATION

Jerry D. Schermerhorn, Swanton, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 9, 1971, Ser. No. 197,003

Int. Cl. H01j *9/00*

U.S. Cl. 316—17 **15 Claims**



There is disclosed a gas discharge device having an inherent memory wherein all electrically operative elements are formed on a common support substrate. The device comprises a monolithic panel structure in which the conductor arrays are created on a single substrate and wherein two or more arrays are separated from each other and from the gaseous medium by at least one insulating member. In such a device the gas discharge takes place not between two opposing members, but between two contiguous or adjacent members on the same substrate.

3,787,107

SCANNER APPARATUS FOR OPTICALLY DISCERNIBLE CHARACTERS

Erwin Sick, Jcking; Gernot Pinior, Germering, and Johann Plockl, Unterhaching, all of Germany, assignors to Zellweger AG Apparate und Maschinenfabrik Uster, Uster, Switzerland

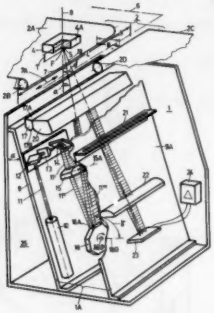
Filed Jan. 28, 1972, Ser. No. 221,703

Claims priority, application Switzerland, Mar. 23, 1971, 4238/71

Int. Cl. G01n *21/30*; **G02b** *17/00*

U.S. Cl. 350—7 **7 Claims**

A scanner apparatus for optically discernible characters, especially characters associated with an article and applied thereat or thereto, wherein a transmitted beam which on the basis of a rotary- or oscillating movement of a movable component of a beam deflecting mechanism which produces or further conveys a light beam scans about an axis of a reference plane. According to the invention a first cylindrical lens member is arranged between the reference plane and the movable component of the beam deflecting mechanism. This



first cylindrical lens member extends in the scanning direction and images or portrays the surface of the beam deflecting member, which transmits the transmitted light beam at least when the transmitted light beam impinges perpendicularly upon the scanning track, within a depth of focus region which contains the reference plane.

3,787,108

DEVICE FOR ADJUSTING THE FOCAL POINT OF A PHOTOGRAPHIC LENS

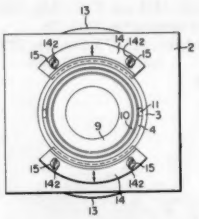
Tadashi Ito, and Kanehiro Sorimachi, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1971, Ser. No. 208,610

Claims priority, application Japan, Dec. 23, 1970, 45/129046

Int. Cl. G02b *7/02*

U.S. Cl. 350—252 **1 Claim**



In a device for adjusting the focal point of a photographic lens which comprises a reception cylinder, a rotatable cylinder and a lens holding cylinder, the rotatable cylinder has an annular groove formed peripherally thereof and engageable with sloped surfaces formed on anti-slip members. The anti-slip members are adjustable to a position for smoothly rotating the rotatable cylinder within the reception cylinder.

3,787,109

INSIDE HELMET SIGHT APPARATUS

Richard P. Vizenor, Wright, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

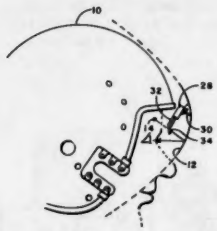
Filed June 28, 1972, Ser. No. 266,995

Int. Cl. G02b *5/08*

U.S. Cl. 350—302 **8 Claims**

Helmet mounted display apparatus in which a reflective inside surface of a partially transparent visor is used as the pri-

mary optical element. A paraboloidal inside visor surface coated with a metallic film may be used. A light-source image



or a virtual image is positioned at the focal point of the inside surface of the visor. The outside surface of the visor may be coated with an anti-reflective coating.

3,787,110

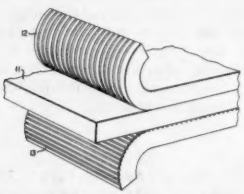
LIQUID CRYSTAL DEVICES

Dwight Winton Berreman, Westfield; Saul Meiboom, Berkeley Heights; Donald Lawrence White, Bernardsville, and Frederic Jay Kahn, Stirling, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 23, 1972, Ser. No. 265,459

Int. Cl. G02f *1/16*

U.S. Cl. 350—160 LC **21 Claims**



Liquid crystal devices, an operation state of which is dependent upon substantially unidirectional liquid crystal orientation, includes a contacting surface which has parallel grooves or ridges. Liquid crystal orientation is attributed to minimization of elastic energy.

3,787,111

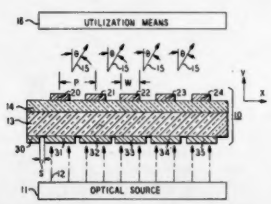
ELECTROOPTIC GRATING FOR SCANNING A BEAM OF LIGHT

Joseph Anthony Giordmaine, Summit, and David Allmond Kleinman, Lebanon, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 16, 1973, Ser. No. 351,167

Int. Cl. H04n *3/14*

U.S. Cl. 350—160 R **10 Claims**



An optical grating is provided by an array of multiple stripe electrodes on a single major surface of an electrooptic crystal. Advantageously, in one type of operation (scanning), time-varying linear sawtooth voltage potentials (or electrostatic charges) are applied to each electrode. The rise times of these applied sawtooth voltages (or charges) vary for successive electrodes, such that the phase shift undergone by an optical beam propagating through the crystal perpendicular to the major surface varies substantially linearly with distance along the surface in a direction perpendicular to the stripe electrodes. Thereby, the optical beam is deflected (scanned) through an angle which likewise varies linearly with time. In other types of operation (including analog deflection), signal voltages are applied to sawtooth function generators which supply suitable voltages (or charges) to the electrodes, for deflecting the optical beam in accordance with a desired function of time.

3,787,112

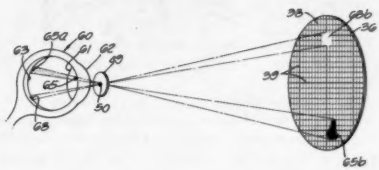
APPARATUS AND METHOD FOR THE SELF-EXAMINATION OF CERTAIN CONDITIONS OF THE EYE

John H. Lyons, 351 Rancho St., Ridgecrest, Calif.

Filed Aug. 3, 1972, Ser. No. 277,528

Int. Cl. A61b *3/02*

U.S. Cl. 351—18 **17 Claims**



Apparatus and method for the self-examination of certain conditions of the eye as, for example, the presence, location and nature of a cataract, retinal damage, scars and injuries, etc. Diffused light is introduced into the eye through an eyepiece supported coaxially of the pupilary axis thereby permitting the user to perceive a cataract on his eye and to view in very substantially enlarged form, the cataract and/or certain other conditions of his own eye on a translucent target or screen forwardly of his eye which target is prefereably imprinted with a network of lines useful in the accurate transfer and recording of observed conditions and faults onto a sheet bearing a similar network.

3,787,113

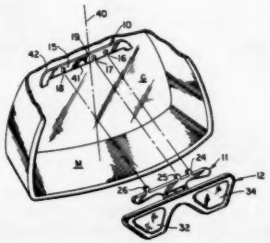
EYEGLASSES, AND MOUNTING MEANS THEREFOR

Sidney Shedrow, 202 E. Gaston St., Savannah, Ga.

Filed Sept. 20, 1972, Ser. No. 290,713

Int. Cl. G02c *9/02, 9/04, 7/08*

U.S. Cl. 351—43 **6 Claims**



Mounting means for mounting a pair of visually corrective eyeglasses within a protective mask including an attaching

means fixed to the viewing glass of the protective mask, the attaching means having a plurality of notches in its lower edge, a carrier having a plurality of tabs to be received within the notches to fix the carrier to the attaching means, the eyeglasses being pivotally carried by the carrier. The arrangement is such that the eyeglasses, with the carrier, are removable from the attaching means; and, when the eyeglasses are in place within the mask, the mask itself locates the eyeglasses with respect to the wearer's eyes.

3,787,114

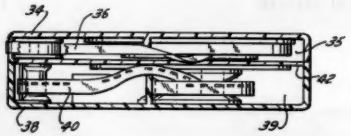
AUDIO-VISUAL SYSTEM

Paul D. Catalano, Manhasset; Norman Buten, Douglaston, both of N.Y.; George H. Eash, Encino, Calif., and Frank V. Emanuel, Cherry Hill, N.J., assignors to Retention Communication Systems, Inc., New York, N.Y.

Division of Ser. No. 97,794, Dec. 14, 1970, Pat. No. 3,733,119. This application Apr. 17, 1972, Ser. No. 244,987

Int. Cl. G03b *31/04*

U.S. Cl. 352—31 **2 Claims**



An audio visual projector adapted to removably receive a single cartridge containing an endless tape having a sound track and a signal track thereon on a first reel and an endless film strip in a loop in side by side relationship. The projector responsive to engagement with the cartridge so as to transmit the audio program on the sound track and to advance and project the film strip portion in response to predetermined signal on the audio tape. A cooling system is in the projector for cooling the film and tape of the cartridge by drawing air through the cartridge along a predetermined plenum path.

3,787,115

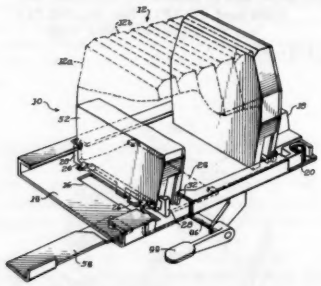
INDEXING MECHANISM

Joerg Fischer, Wilmette, Ill., assignor to Bell and Howell, Chicago, Ill.

Filed Jan. 26, 1972, Ser. No. 220,952

Int. Cl. G03b *21/04*

U.S. Cl. 352—123 **4 Claims**



An indexing mechanism for sequentially presenting each of a plurality of cassettes containing photographic film to a projection station in a film projector. The indexing mechanism includes an escapement member having two pairs of stop members that are alternately placed in and out of engagement abutments on the cassette.

3,787,116

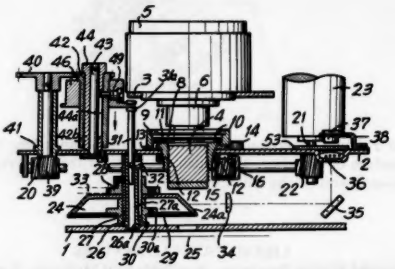
EXPOSURE CONTROLS FOR MOTION PICTURE CAMERAS

Tatsuro Shimizu, Tokyo, Japan, assignor to Asahi Kogaku Kogy Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 8, 1972, Ser. No. 313,514

Int. Cl. G03b *7/08*

U.S. Cl. 352—141 **12 Claims**



A motion picture camera which has an adjustable diaphragm capable of being automatically adjusted by a drive which operates in response to a change in the light received by a light-responsive structure. The camera includes a rotary shutter having an opening through which film in the camera is exposed as well as an adjusting plate coaxial with the rotary shutter so that when the shutter and adjusting plate are turned one with respect to the other the size of the shutter opening can be adjusted. A suitable adjusting structure is operatively connected with the shutter and adjusting plate for turning them one with respect to the other to adjust the shutter opening, and this adjusting structure is driven from the drive which adjusts the diaphragm, so that when the diaphragm is adjusted the shutter opening is also adjusted.

3,787,117

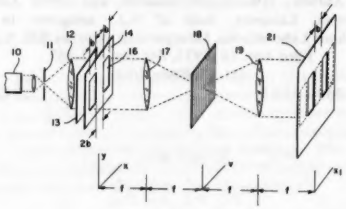
METHODS AND APPARATUS FOR INSPECTING WORKPIECES BY SPATIAL FILTERING SUBTRACTION

Laurence Shrapnell Watkins, Hopewell Twp., Mercer, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 2, 1972, Ser. No. 294,284

Int. Cl. G03b *21/14*

U.S. Cl. 353—20 **23 Claims**



Integrated circuit and thin-film photomasks are inspected by a spatial filtering subtraction technique. The photomask to be inspected is illuminated by coherent, collimated radiation from a laser. An apertured mask is placed in front of the photomask to block light from all except two, spaced-apart columns in the array of features on the photomask. A lens forms Fraunhoffer diffraction patterns of the two apertured portions of the photomask at the focal plane of the lens, and

these patterns are passed through an asymmetrically positioned optical grating. The diffraction patterns are then displayed on a screen. The grating produces a central image and two side images of each apertured portion of the photomask. The centermost side images of each aperture are 180° out of phase and cancel, because the columns of the photomask are identical. Differences between the two columns, which include nonperiodic errors in the photomask, are not cancelled and, hence, are readily detected.

3,787,118

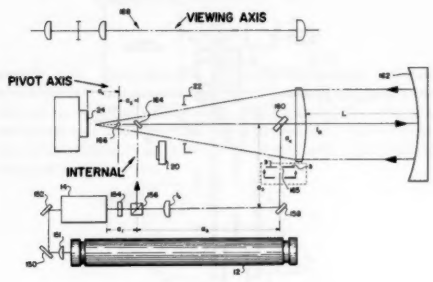
COMPENSATION MEANS FOR POLARIZED LIGHT ELECTRO-OPTICAL MODULATOR

Thomas Nowicki, Oakland, N.J.; John I. Shipp, Tullahoma, Tenn.; Robin H. Hines, Tullahoma, Tenn., and Thomas D. Broadbent, Tullahoma, Tenn., assignors to AGA Corporation, Seacaucus, N.J.

Filed July 11, 1972, Ser. No. 270,705

Int. Cl. G01c *3/08*

U.S. Cl. 356—5 **7 Claims**



When a polarized light beam is electro-optically modulated as it passes through a birefringent crystal there are created observed divergent beams caused by internal diffraction. In order to eliminate these observed divergent beams from the central beam so as to avoid distortion caused by interference between the divergent beams and the main central beam, a converging lens is placed between the source of polarized light and the birefringent crystal to converge the central beam at a point substantially distant from the output of the birefringent crystal. At a point beyond the focal length of the converging lens there is placed an aperture aligned with the central beam and of a size equal to the size of the central beam, but small enough so as not to pass any light from the divergent beams, thus eliminating these divergent beams and allowing just the central beam, properly modulated, to pass through the aperture.

3,787,119

CATHETERIZABLE MULTIPLE PHOTOMETER USABLE IN ANY PENETRABLE MEDIUM

Boris Rybak, Universite De Caen Faculte des Sciences Zoophysiologie, Caen, France

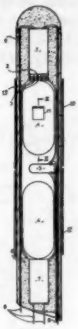
Filed Jan. 31, 1972, Ser. No. 222,169

Claims priority, application France, Jan. 29, 1971, 7103675

Int. Cl. G01n *21/00, 33/16;* **G01j** *1/42*

U.S. Cl. 356—73 **7 Claims**

The device of the invention is constituted by a multiple photometer mounted in a catheter and comprising at least two associated photosensitive cells placed at a certain distance from one another and separated by open spaces called dishmembers and at least one microlamp for energizing the said photosensitive cells.



Said device allows continuous measurements, particularly in blood in vivo, of physical and chemical characteristics by means of natural or artificial colouring matters.

3,787,120

APPARATUS FOR ATOMIC ABSORPTION SPECTROPHOTOMETRY

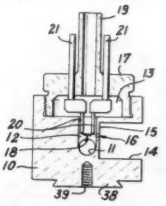
Bernard Hircq, Arpajon, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Feb. 2, 1972, Ser. No. 222,734

Claims priority, application France, Feb. 8, 1971, 7104146

Int. Cl. G01j *3/02, 3/42*

U.S. Cl. 356—85 **9 Claims**

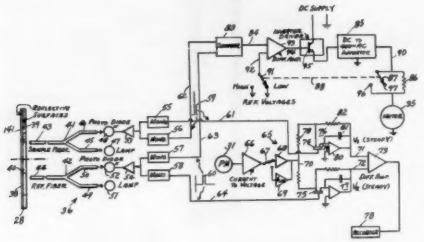


The apparatus is of the atom-generating filament type and comprises a T-shaped tubular cell, the rectilineal tube at the top of the T being traversed by a light beam whilst the central stem of the T is a tube containing the filament. A cell-holder contains the rectilineal tube which is optically open at its two opposite extremities, and a cap unit containing the central tube together with a filament of adjustable height is screwed onto the cell-holder. A rare or inert gas is introduced through the central tube in order to permit continuous sweeping with a stream having a constant flow which passes through the filament and is discharged to free air through the extremities of the rectilineal tube.

3,787,121
MULTIPLE FUNCTION SPECTROPHOTOMETER HAVING AN AUTOMATICALLY STABILIZED CHOPPER DISC

George W. Lowy; Joseph M. Conlon, both of Silver Spring, and Byron E. Marcus, Columbia, all of Md., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Dec. 18, 1972, Ser. No. 315,875
Int. Cl. G01j 3/42, 3/12
U.S. Cl. 356—93 19 Claims

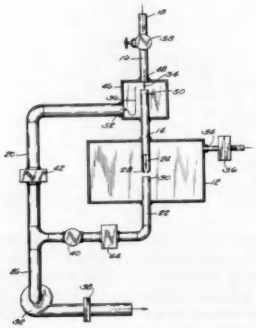


A spectrophotometer of the two-beam type employing two adjustable monochromators and employing a rotating chopper disc to provide time-sharing operation, such as split-beam operation, dual wavelength operation, or other desired modes of operation. The chopper disc motor is stabilized by a fiber optic feedback system and cooperating electronic system utilizing light beams reflected by the underside of the chopper disc and photo diodes responding to these reflections. The main optical system includes an adjustable lens element coupled to one of the monochromators to compensate for variations in refractive index of the lens element with wavelength. The electronic readout system is gated by the chopper disc stabilizing system to maintain synchronism of the readout signals with the two monochromatic excitation beams.

3,787,122
LIGHT SCATTERING PARTICLE ANALYZER

James M. Lepper, Jr., Madison, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Jan. 5, 1973, Ser. No. 321,310
Int. Cl. G01n 21/00; G01j 3/46
U.S. Cl. 356—103 11 Claims

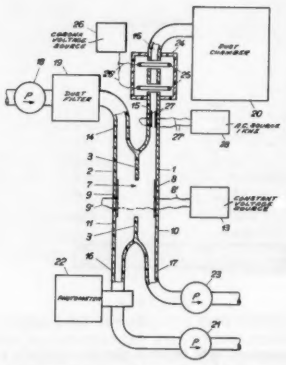


A light scattering device for analyzing colloidal particles in a fluid which includes an intake conduit through which a relatively high volume flow of the fluid to be analyzed is drawn by a pump. The intake stream is divided into a sample stream, which comprises a minor fraction of the intake stream and is drawn through an optical sensing chamber via a sample inlet nozzle for analysis, and a by-pass stream, which comprises the remaining portion of the intake stream and is drawn through a conduit by-passing the optical sensing chamber. A trickle flow of purging air is introduced into the sensing chamber through a small filter during normal operation. When flow through the intake conduit is shut off, the pump draws a high volume flow of purging air through the filter to rapidly purge residual particles and other similar contaminants from both the sensing chamber and the sample inlet nozzle.

3,787,123
METHOD AND APPARATUS FOR MEASURING THE WEIGHT OF SOLID PARTICLES SUSPENDED IN A CARRIER GAS

Willy Sigrist, Ennetbuergen, Switzerland

Filed Mar. 27, 1972, Ser. No. 238,197
Claims priority, application Switzerland, Mar. 29, 1971, 4552/71
Int. Cl. G01n 21/26
U.S. Cl. 356—103 6 Claims



The weight of particles suspended in a carrier gas is determined regardless of particle size by electrically charging the suspended particles in the carrier gas, thereafter jointly passing the carrier gas and a stream of pure gas under conditions of at least approximately laminar flow through an electric field arranged to cause a portion of the charged particles to migrate into the pure gas, and thereafter separating the initially pure gas from the carrier gas and measuring the amount of particles suspended in the initially pure gas by conventional means. It is shown that the measured values obtained are independent of the particle size and provide an indication of the weight of particles suspended in the carrier gas.

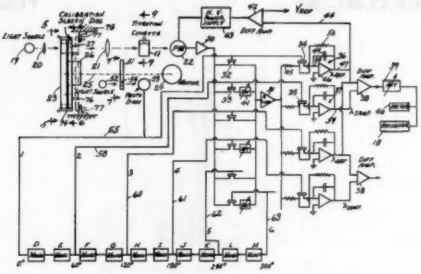
3,787,124
DUAL WAVELENGTH PHOTOMETER FOR ABSORBANCE DIFFERENCE MEASUREMENTS

George W. Lowy, Silver Spring; Paul Priarone, Hyattsville, and Herbert M. Cullis, Silver Spring, all of Md., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Sept. 21, 1972, Ser. No. 291,046
Int. Cl. G01n 21/24
U.S. Cl. 356—205 16 Claims

A dual wavelength photometer for measuring the oxygenation characteristics of blood. Light is passed through two different filters on a rotating time-sharing wheel, one filter providing a reference wave length at which there is substantially no absorbance change as between oxygenated and deox-

ygenated blood, the other filter providing a wavelength at which there is maximum absorbance change. The two wavelengths are sequentially passed through a cuvette containing deoxygenated blood being treated at controlled rates with an oxygenating reagent and changes in absorbance are detected by a photomultiplier which generates corresponding



signals. A time-shared difference-measuring circuit, synchronized with the rotating wheel, receives the signals and derives a resultant absorbance difference signal which is delivered to a recorder. The trace provided by the recorder shows the change in absorbance-difference with time as blood oxygenation proceeds.

3,787,125

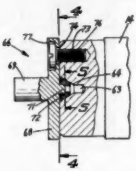
COUPLING ASSEMBLY

Bernart E. Traut, Wayzata, and Vernon A. Kiffmeyer, Watertown, both of Minn., assignors to Washington Scientific Industries, Inc., Minnetonka, Minn.

Division of Ser. No. 850,386, Aug. 15, 1969, Pat. No. 3,582,246. This application May 17, 1971, Ser. No. 144,236

Int. Cl. F16d 1/06

U.S. Cl. 403—13 **7 Claims**



A fluid motor having intermittently rotatable vanes sequentially movable between a radial position and a circumferential position by a circuitous cam mechanism having a third harmonic configuration for substantially constant acceleration and decelertion of the vanes resulting in constant force on the vanes. The motor has a rotor mounted on a housing with the use of a combination sharp edge bearing and seal units. A coupling apparatus, having a flexible O-ring, is centered on the end of the drive shaft of the motor.

3,787,126

HANDLEBAR ASSEMBLIES

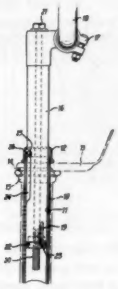
Richard Arlen, West Bridgford, England, assignor to Raleigh Industries Limited, Nottingham, England

Filed Jan. 6, 1972, Ser. No. 215,777

Claims priority, application Great Britain, Jan. 7, 1971, 767/71

Int. Cl. F16b 7/10

U.S. Cl. 403—104 **8 Claims**



This invention concerns a handlebar assembly in which a handlebar stem is provided to be located within the front fork tube in such a manner that it can be raised or lowered by an amount determined by the length of a track formed in the handlebar stem which contains a ball captive in the steering head locknut.

3,787,127

BALL JOINT

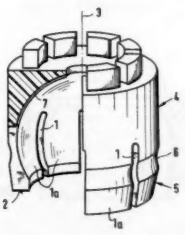
Richard Cutler, Wiesenweg, Germany, assignor to Gottfried Reuter GmbH, Lemforde, Germany

Filed Nov. 22, 1971, Ser. No. 201,081

Claims priority, application Germany, Nov. 23, 1970, P 20 57 513.7

Int. Cl. F16c 11/06

U.S. Cl. 403—133 **4 Claims**

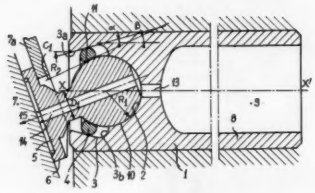


A ball and socket joint is provided having a casing with a bore closed at one end with a cover, a ball in the casing and a resilient bearing between the ball and the wall of the bore, the bore being cylindrical from the opening closed by the cover to a point below the maximum cross-section of the ball where it merges into a frustoconical portion terminating adjacent the ball pin in an annular inwardly extending flange, the external configuration of the bearing corresponding to that of the wall of the bore, having protuberances adjacent to and compressed by the cover and having circumferentially spaced longitudinal slots in that portion thereof which is frusto-conically shaped to reduce the volume of the bearing and reduce friction when the ball moves with respect to the bearing.

3,787,128
BALL-JOINT RETAINERS FOR THE PISTONS OF HYDRAULIC MOTORS AND PUMPS

Roger Maistrelli, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, France

Filed May 28, 1971, Ser. No. 147,794
Claims priority, application France, June 30, 1970, 70.24191
Int. Cl. F16c 11/06
U.S. Cl. 403—135 2 Claims

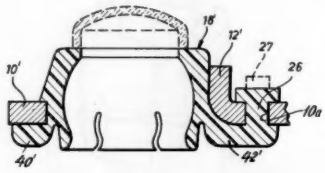


This device intended essentially for maintaining the mutual swivel engagement between a swash-plate engaging shoe and a piston in a barrel-type hydraulic pump or motor, of the type comprising a swivel ball rigid with the shoe and adapted to engage a corresponding cavity in the relevant piston, comprises a ring, a groove formed in said piston cavity and engageable by said ring, the configuration of said retaining member and groove being such that the retaining member can be fitted without play, while preserving the possibility of taking up plays due to manufacturing tolerances while safely retaining the shoe by virtue of a wedging effect.

3,787,129
UNIVERSAL JOINT BALL MOUNTING CONSTRUCTION

Alfred Kohler, Bietigheim/Wurttemberg, and Kurt Bauer, Kleiningersheim/Wurttemberg, both of Germany, assignors to SWF Spezialfabrik fur Antozubehor Gustav Raw GmbH, Bietigheim/Wurttemberg, Germany

Filed Mar. 22, 1972, Ser. No. 237,109
Claims priority, application Germany, Apr. 3, 1971, P 21 16 463.6
Int. Cl. F16c 11/06
U.S. Cl. 403—135 4 Claims

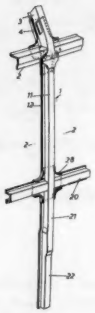


A universal joint ball mounting comprises a pivot rod member having an opening therethrough and with a ball receiving socket secured on the rod member which extends through the opening and which provides a generally semi-spherical ball pivot surface on its interior for receiving a ball member of a universal joint. The rod member carries an outstanding lug disposed around a portion of the opening on each side thereof which define interior bearing surfaces which bear against the socket. The remaining area around the opening of the rod member defines a tongue which is engaged in a groove formation of the socket member. The socket member also advantageously includes a deformable upper part which may be bent into engagement over the top of the lugs.

3,787,130
MOTOR VEHICLE JOINT

Keith Reginald Hemmings, Adlington, and Gerald Fowler, Eccleston Nr. Chorley, both of England, assignors to British Leyland Truck and Bus Division Limited, Leyland, Lancashire, England

Filed Aug. 25, 1971, Ser. No. 174,772
Claims priority, application Great Britain, Aug. 26, 1970, 40,975/70; Sept. 16, 1970, 44,174/70
Int. Cl. F16b 7/00
U.S. Cl. 403—205 7 Claims

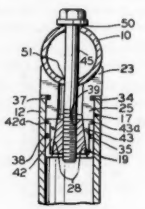


An integral construction motor vehicle is provided having a body including first and second frame members to which panel members are attached the frame members being connected by a jointer in the form of a plate which extends between two frame members and is rivetted to them.

3,787,131
PIPE ANCHOR

Frederick S. Reachek, 1259 Charles Ave., Lakewood, Ohio

Filed Apr. 5, 1972, Ser. No. 241,270
Int. Cl. F16b 7/04
U.S. Cl. 403—234 9 Claims

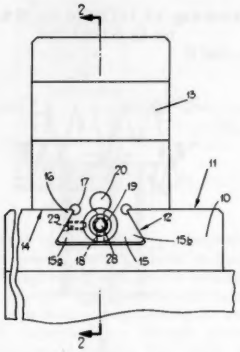


A device for connecting a pair of mutually transversely extending tubular structural members. A tubular member having a body and a head is split lengthwise into complementary half sections resiliently connected together. The body fits within one structural member and the head is connected to the second structural member. A bolt passes through the second structural member and threadedly engages a plug in the body of the tubular member. Tightening of the bolt moves the plug axially in the body and causes the body to expand and grip the inner walls of the second structural member.

3,787,132
CLAMPING ARRANGEMENT

Charles Alexander Garnett, Worcester, England, assignor to Edward Williams Holdings Limited, Birmingham, England

Filed Apr. 6, 1971, Ser. No. 131,691
Claims priority, application Great Britain, Apr. 7, 1970, 16,395/70
Int. Cl. F16b *12/20*
U.S. Cl. 403—290 10 Claims

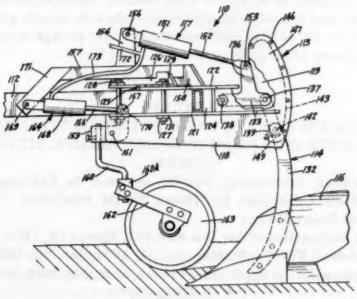


An arrangement for securing an attachment to a body has a split dovetail extending from the attachment and slidable in a dovetailed recess in the body. One portion of the split dovetail is flexed by a wedge arrangement to provide a clamping action. The other portion of the dovetail is not deflected by wedging action and thereby provides a relatively fixed locating face.

3,787,133
CLAMP AND POSITIONING STRUCTURE

Cletus J. Geurts, 530 N. Melvin, Gibson City, Ill.

Division of Ser. No. 124,753, March 16, 1971. This application Jan. 27, 1972, Ser. No. 221,286
Int. Cl. F16b *7/00*
U.S. Cl. 403—284 18 Claims

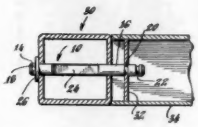


An earth working implement having a high ground clearance beam connected to a frame unit having side plates. A clamp assembly having bolts and eccentric washers mounts the frame unit to a beam of the implement. A block secured to the beam cooperates with the clamp assembly to position the clamp assembly on the beam. An articulated linkage is connected to an earth working tool and pivotally joined to the frame unit. Tracks on the side plates cooperate with rollers on the standard to guide the movement of the plow bottom to a trip position without the plow bottom going below its normal earth working position. A hydraulic cylinder acting on the standard continuously holds and biases the plow bottom to its earth working position. A second hydraulic cylinder biases a colter to its earth working position.

3,787,134
PIN FOR INTERCONNECTING TWO PARTS OF A KNOCKDOWN ASSEMBLY

Alan Carleton Burr, East Norwalk, Conn., assignor to Howe Folding Furniture, Incorporated, New York, N.Y.

Filed Feb. 28, 1972, Ser. No. 230,003
Int. Cl. F16b *13/00*
U.S. Cl. 403—408 2 Claims

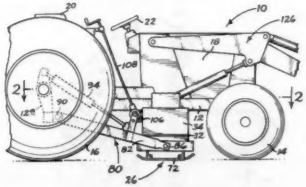


A pin which has one circumferential groove adjacent one end and has two axially spaced circumferential grooves adjacent its other end, is long enough to be inserted through a member of a knock down assembly, with its grooved ends extending beyond opposite faces of the member respectively, in position for either or both ends to be inserted through a slot in an opposed end of another member of the assembly and to receive in a groove the edge of a slot defining portion of an opposed other member of the assembly. At a predetermined position between its ends the pin is reduced in diameter for a predetermined distance and shaped so that two of the pins may be inserted through the said member in crossed relation and disposed in the same plane.

3,787,135
VEHICLE AND VIBRATING COMPACTOR COMBINATION

Jack D. Layton, Salem, Oreg., assignor to Layton Manufacturing Company, Salem, Oreg.

Filed Apr. 7, 1972, Ser. No. 242,000
Int. Cl. E01c *19/34*
U.S. Cl. 404—113 10 Claims



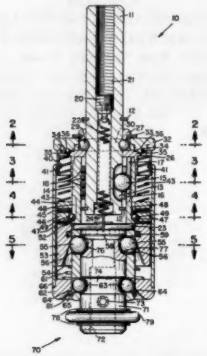
A vehicle and vibrating compactor combination, where the compactor is connected to the vehicle to move over the ground with movement of the vehicle. The compactor can be raised to elevate a compacting plate bottoming the compactor above the ground. Means in the combination provides for changing the position of the compactor and its compacting plate to enable it to be placed at different inclined positions with respect to the ground while in ground contact. This adjustment occurs with a change in the mode of operation of the compactor. Adjustable limit means defines the limits of different inclined positions for the compactor plate.

3,787,136

ADJUSTABLE TORQUE CONTROLLED TOOL HOLDER

Rudolph Steiner, Fairport, N.Y., assignor to Numertap, Inc., Rochester, N.Y.

Filed Jan. 2, 1973, Ser. No. 320,623
Int. Cl. B23b 47/24
U.S. Cl. 408—139 10 Claims



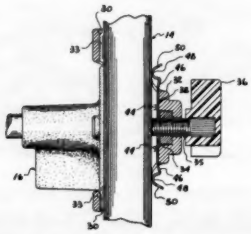
The holder has a shank to be driven by a machine spindle, a sleeve axially slidable on the shank and rotatable thereby, and an adapter removably connected to the sleeve for rotation thereby. The adapter carries a removable tool, and is releasably coupled to the sleeve by a spring-loaded torque ring, which is axially slidable on the sleeve and holds a plurality of ball couplers resiliently in driving engagement with recesses in the adapter. When a predetermined torque is exceeded the balls are forced out of the recesses to interrupt the drive to the adapter, and also to force the torque ring upwardly to inoperative or released position. The sleeve is held in released position by a ball coupling which is engaged in stepped angularly and longitudinally spaced recesses in the sleeve.

3,787,137

ADJUSTABLE LOCK FOR A COLUMN MOUNTED TOOL

Earl G. Renner, St. Charles, Ill., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Nov. 21, 1972, Ser. No. 308,430
Int. Cl. B23b 47/26
U.S. Cl. 408—241 R 9 Claims



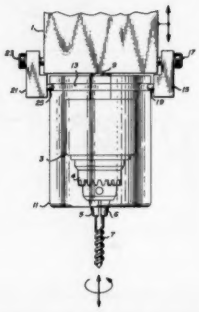
This invention has particular utility in the drill press art where it is desired to adjust and lock a column head, to which a power tool is connected, heightwise on its supporting column. The head has a bore that fits freely over the column, and a leaf spring is secured to the head in the bore and engages the column to impose a continuous drag between the head and column of magnitude greater than the weight of the head and tool so that the head will not slide under this weight along the column but instead will remain stationary until moved by the manually applied height adjusting force. A manually controlled lock is also carried in the head which can be engaged to permanently lock the head at the adjusted column position.

3,787,138

SPINDLE MOUNTED PERSONNEL PROTECTOR

John Pershing Vernon, and Douglas Wayne Lamkins, both of Springfield, Mo., assignors to Litton Systems, Inc., Springfield, Mo.

Filed Aug. 23, 1972, Ser. No. 283,107
Int. Cl. B23b 47/00
U.S. Cl. 408—241 G 1 Claim



A spindle mounted personnel protector provides a barrier for a rotating drill chuck which prevents an operator's hair or other objects from becoming entangled with such a rotating part, while permitting full view of the work. This includes a hollow elongated cylinder of transparent plastic material which fits over and ensleeves the drill chuck. The cylinder contains a groove in its outer surface proximate the upper end of the cylinder and such groove extends about the circumference of the cylinder. A set of three mounting brackets are evenly spaced about and are attached to the drill housing, a non-rotating element of a drill press. The brackets each extend to beneath the housing and each includes a radially inwardly projecting prong. The prongs engage the groove in the plastic cylinder to thereby support the cylinder in place. The plastic cylinder is easily removed by downwardly pulling upon an end of same, as would be done when it is desired to change drill bits, and is easily reinserted into place by simply pushing upward on the bottom end until the bracket prongs re-engage in the groove of the plastic cylinder.

3,787,139

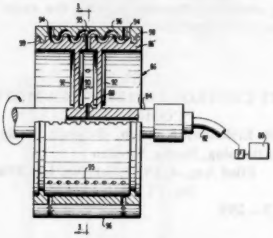
PROCESS FOR THE PREPARATION OF TITANIUN CONCENTRATES FROM IRON-CONTAINING TITANIUM ORES

Felix Oster, Strasbourg, France, assignor to Fabriques De Produits Chimiques De Thann Et De Mulhouse, Thann, (Haut-Rhin), France

Continuation of Ser. No. 808,197, March 18, 1969, abandoned. This application Oct. 15, 1971, Ser. No. 189,602
Claims priority, application France, Mar. 26, 1968, 68.1860
Int. Cl. C01g 23/04
U.S. Cl. 423—610 9 Claims

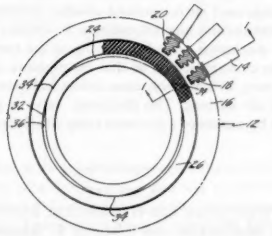
A titanium concentrate is made from an ilmenite or other iron-containing titanium ore by treatment with aqueous hydrochloric acid of the azeotropic concentration while maintaining this concentration by continuously removing excess water by distillation. Preferably, when as much iron as practicable or desired has dissolved, the distillate is returned, or water from some other source added, to the mixture, which is then boiled further for a short time under total reflux to precipitate titanium which may have dissolved.

3,787,140
POWER PLANT
Alvin L. Gregory, 5860 Callister Ave., Sacramento, Calif.
Filed Oct. 4, 1971, Ser. No. 186,092
Int. Cl. F01d 3/00, 5/08
U.S. Cl. 415—80 8 Claims



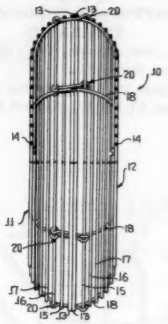
A prime source of mechanical power comprising an expansion chamber, an inlet into which expansible fluid is injected, and an outlet through which said fluid is exhausted after expansion in said chamber. Expansion of said fluid is achieved by application of a heat source directly to the expansion chamber, which expansion acts through piston means to create useful mechanical motion. The engine may be of a reciprocating type, rotary or novel turbine, while the heat source can be solar, gaseous, petroleum, nuclear, or electrical. In addition, it is conceived that the novel turbine engine can produce motion by either a rotor driven by a stator or a stator driven by a rotor.

3,787,141
FILAMENT REINFORCED MOTOR ASSEMBLY
Thomas C. Walsh, New Britain, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Nov. 30, 1972, Ser. No. 310,759
Int. Cl. F01d 5/30
U.S. Cl. 416—244 4 Claims



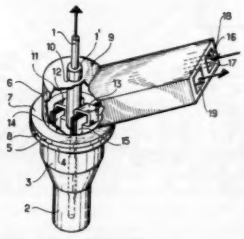
A radially outwardly facing annular surface of a non-composite rotatable member, such as a rotor disc, includes a plurality of lobes extending radially outwardly from the surface. A filament reinforced composite annular ring surrounds the surface and is disposed on the lobes which serve to position it with respect to the rotatable member. The ring is spaced from the surface between adjacent lobes when the member is not rotating. The member is thus able to expand radially more rapidly than the composite ring which will deform as the member grows to reduce the space between it and the member until they are in contact or until the ring is taut whereupon the ring begins to carry the centrifugal loads of the rotating member.

3,787,142
FAN GUARD
Roger C. Dupke, 707 Jefferson St., Merrill, Wis.
Filed May 1, 1972, Ser. No. 249,272
Int. Cl. F04d 29/70
U.S. Cl. 416—247 12 Claims



This disclosure relates to fan guard which includes a pair of guard halves each including a plurality of peripheral wires circumscribing progressively reduced areas from a first peripheral wire toward a most remote and smaller second peripheral wire with at least an additional peripheral wire therebetween, the guard halves being disposed with the first peripheral wires adjacent each other and means in the form of hooks pivotally connected to the additional peripheral wire of a first of the pair of guard halves and hooked upon the additional peripheral wire of a second of the pair of guard halves for maintaining the same in assembled relationship. Each hook includes an eye and a hooking nose at opposite ends of a spanning portion and the spanning portions are disposed inboard of, in contact with, and in spanning relationship to the first peripheral wires of both the first and second guard halves.

3,787,143
IMMERSION PUMP FOR PUMPING CORROSIVE LIQUID METALS
Henri Carbonnel, Antony, and Robert Borie, Sceaux, both of France, assignors to Groupement Atomique Alsacienne Atlantique, Le Plessis Robinson, France
Filed Mar. 16, 1972, Ser. No. 235,271
Claims priority, application France, Mar. 16, 1971, 71.09159; Mar. 30, 1971, 71.11143
Int. Cl. H02k 1/12
U.S. Cl. 417—50 8 Claims



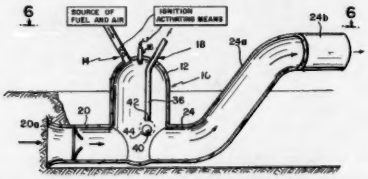
Immersion pump having slight bulk, for liquid metals, operating by conduction, consisting of one or two magnetic circuits, a conduction loop made of liquid metal and of two electrodes limiting the liquid metal duct in the active zone. A

refractory material is cast round the components of the pump, and protects them against the corrosive action of the liquid metal. The part which is not immersed comprising the induction windings of the magnetic circuits is protected by a cast aluminum steel housing.

3,787,144
EXPLOSIVE PUMPING AND DREDGING METHOD AND APPARATUS

Charles D. Wood, San Antonio, Tex., assignor to Southwest Research Institute, Bexar, Tex.

Filed June 29, 1972, Ser. No. 267,602
Int. Cl. F04f 1/16; E02f 3/88
U.S. Cl. 417—74 **9 Claims**

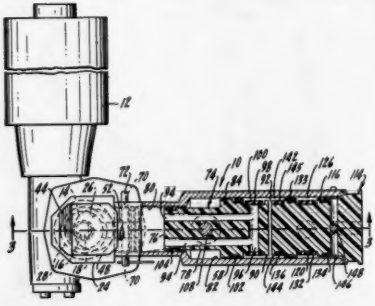


A method and apparatus particularly suited for underwater dredging, trenching and the like. An explosion chamber is provided with a fuel source, a fuel ignitor and an exhaust outlet. A dreg intake conduit having a check valve communicates with the explosion chamber as does a dreg exhaust chamber. Material to be dredged enters the dreg intake and fills the explosion chamber to a certain level while fuel is admitted to the explosion chamber. The fuel is burned or exploded which closes the check valve in the dreg intake and forces the dreg material out through the exhaust conduit.

3,787,145
MIXING PUMP ASSEMBLY

Richard Martin Keyes, Rockford, and Bertel Swan Nelson, Naperville, both of Ill., assignors to Beatrice Foods Company, Chicago, Ill.

Filed Feb. 18, 1972, Ser. No. 227,481
Int. Cl. F04b 23/04, 23/06, 19/02
U.S. Cl. 417—250 **8 Claims**

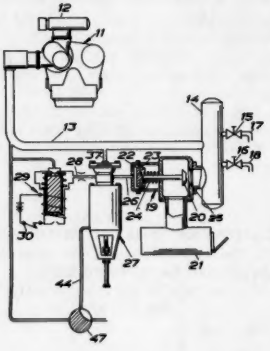


A double-acting proportioning pump having a receiving chamber and a mixing chamber for accurately mixing and delivering two fluids such as a liquid and air in a system. The double-acting pump includes a single stationary piston and reciprocating cylinder whereby the fluids are conveyed and mixed by the alternate expansion and contraction of each pump chamber, with one of the fluids passing from the receiving chamber to the mixing chamber through the single piston element. The pump is cylindrical with end cap members at each end thereof; the piston is disposed between the end caps and the two pump chambers are each defined by an end cap member and one radial end face of the piston. Cyclical valve means alternately open and close the passage through which one of the fluids communicates with the receiving chamber. Adjustable air inlet means vary the quantity of air admitted to the mixing chamber, thereby varying the ratio of mixed ingredients in the final product.

3,787,146
DELIVERY CONTROL SYSTEM FOR A MOTOR DRIVEN COMPRESSOR

Sven Evald Eriksson, Kontich, Belgium, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Aug. 4, 1971, Ser. No. 168,856
Int. Cl. F04b 49/02
U.S. Cl. 417—299 **5 Claims**



A screw compressor is mounted on a truck and adapted to deliver compessed air for ground checks, starting jet engines, and air-conditioning aircraft cabines. Its delivery pipe has an automatic discharge valve for venting to the atmosphere part or all of the compressed air so that the pressure in the delivery pipe will vary within very close limits independently of the amount of air utilized. The discharge valve is pneumatically controlled by means of a pressure relay which has a very quick action.

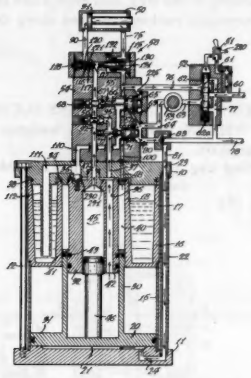
3,787,147
TWO-STAGE AIR-HYDRAULIC BOOSTER

Samuel B. McClocklin, and Clarence L. Kostelecky, both of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.

Filed Dec. 26, 1972, Ser. No. 318,088
Int. Cl. F04b 17/00, 35/00; F15b 7/00
U.S. Cl. 417—302 **15 Claims**

A two-stage air-hydraulic booster having two pumping chambers, with one being a relatively large-volume, low-pressure chamber and the other a relatively small-volume, high-pressure chamber and with both chambers being formed, in part, by pumping structure carried by an air-operated piston. The ratio of the area of the air-operated piston to the area of the hydraulic cylinder for the large-volume, low-pressure chamber is relatively low whereby a large volume of fluid per inch of stroke is delivered to the system while the ratio of the area of the air-operated piston to the area of the high-pres-

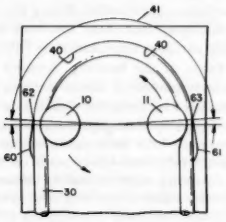
sure, small-volume chamber is high to deliver a small volume of fluid per inch of stroke of the air-operated piston. The structure provides for minimal consumption of operating air in both advancing the movable air-operated piston in a pumping stroke and in return of the air-operated piston to an initial position.



3,787,148
ROLLER PUMP

J. David Kopf, Tujunga, Calif., assignor to David Kopf Systems, Tujunga, Calif.

Filed Sept. 26, 1972, Ser. No. 292,314
Int. Cl. F04b *43/08, 43/12, 45/06*
U.S. Cl. 417—477 **6 Claims**



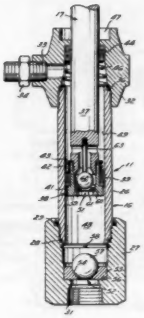
A roller pump with a pair of opposed rollers which travel in a circular path concentric with a bearing surface of angular length less than 180° and squeeze a flexible tube against the bearing surface. Lead ramps extend outwardly from the ends of the bearing surface so that as one roller begins to squeeze the flexible tube, the opposite roller begins to disengage said flexible tube; thereby providing a relatively constant driving torque and smooth operation of the pump.

3,787,149
PUMP FOR ZINC-RICH MATERIALS OR THE LIKE

Oscar Dane, Houston; Ronald Wentworth Beers, Spring, and Gustave Stanley Levey, Houston, all of Tex., assignors to Gustave S. Levey, trustee, Houston, Tex.

Filed Mar. 24, 1971, Ser. No. 127,676
Int. Cl. F04b *21/06*
U.S. Cl. 417—554 **14 Claims**

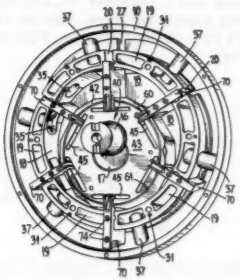
A pump for use in the airless spraying of zinc-rich materials or the like is disclosed. The pump is provided with valves in which the mating valve surfaces are constructed to avoid excessive localized pressure and incorporate elements formed of materials with which zinc-rich coating materials or the like do not tend to form weld type bonds. In one embodiment, a ball check valve includes a rigid ball encased in a polyurethane jacket which seats against a spherical valve seat. In another embodiment, the valve seat is provided by an O-ring formed of elastomeric material.



3,787,150
ROTARY MOTOR

Tony Ralph Sarich, 2 Hadley Pl., Karrinyup, Bayswater, Australia

Filed July 6, 1971, Ser. No. 159,834
Claims priority, application Australia, July 6, 1970, 1737/70
Int. Cl. F02b *53/00*
U.S. Cl. 418—61 **15 Claims**

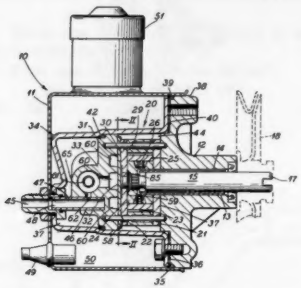


A rotary vanes type motor having a plurality of vane mounted for reciprocal movement in a housing in a radial direction with respect to a shaft journalled in the housing. A piston member is eccentrically mounted on the shaft in the housing so that the piston member will orbit without rotation in the housing as the shaft rotates. The vanes are connected to the piston member so as to reciprocate when the piston member orbits. The housing, vanes, and piston member defining a plurality of chambers to which a working fluid may be admitted in sequence to induce orbiting of the piston member and resulting rotation of the shaft.

3,787,151
STACK-UP ASSEMBLY

Robert Edward Carlson, Livonia, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed July 7, 1972, Ser. No. 269,766
Int. Cl. F01c *19/08*; **F03c** *3/00*; **F04c** *15/00*
U.S. Cl. 418—133 **7 Claims**

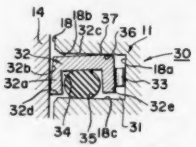


A stack-up pump is provided with a pressure generating area ported through a pressure plate and a separator plate to a valve plate, the separator plate contacting the pressure plate on one side and open to high pressure channels on the other side whereby the separator plate is biased against the pressure plate and the pressure plate in turn against the pressure generating rotor cavity to maintain a seal. To prevent the separator plate from pressing against the pressure plate with sufficient force to bow the pressure plate and seize the rotor, the pressure plate is relieved in areas under the separator plate.

3,787,152
OIL SEAL CONSTRUCTION FOR ROTARY INTERNAL COMBUSTION ENGINE

Masaru Mitsuyama, and Noriyuki Kurio, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima-ken, Japan

Filed June 7, 1972, Ser. No. 260,461
Claims priority, application Japan, June 10, 1971, 46/49545
Int. Cl. F01c *19/00*; **F03c** *3/00*; **F04c** *27/00*
U.S. Cl. 418—142 **10 Claims**

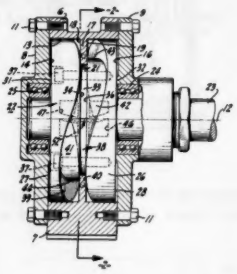


An oil seal construction for use in an internal combustion engine of the rotary type, including a generally annular groove formed in each of the side surfaces of an inner body or rotor and having a generally rectangular cross section, an oil seal ring relatively tightly received within the annular groove with a limited clearance inbetween for sealing engagement with the inner surface of each of the side walls of an outer body or engine housing, and biasing means mounted between the annular groove and the oil seal ring for urging the oil seal ring toward each of the outer body side walls to effect the sealing engagement of the oil seal ring. At least one of the side surfaces of the oil seal ring is locally reduced, or more specifically round or tapered, at the bottom corners thereof, so that smoothly sliding engagement of the oil seal ring with the associated inner side surfaces of the annular groove is effected even when the clearance defined between the side walls of the annular groove and of the oil seal ring is so limited as to prevent unnecessary bouncing of the ring, and even when the inner body experiences inevitable rocking motions along the axis of the outer housing.

3,787,153
POSITIVE DISPLACEMENT MACHINE SUCH AS A PUMP

Benjamin F. Williams, Douglas, Ariz., assignor to Benwilco, Inc., Douglas, Ariz.

Filed Aug. 16, 1972, Ser. No. 280,944
Int. Cl. F03c *3/00*
U.S. Cl. 418—176 **7 Claims**



A positive displacement machine such as a pump or compressor has a drum-like housing having an interior, circular-cylindrical surface symmetrical about a main axis and having a pair of interior, planar, side surfaces normal to the main axis. A drum-like rotor is mounted within the housing for rotation relative thereto about the main axis and has an exterior, circular-cylindrical surface approximately fitting the interior, circular-cylindrical housing surface. Also, the rotor has a pair of exterior, planar, side surfaces approximately fitting the interior, planar, side surfaces of the housing. Around the rotor is a peripheral groove symmetrical about a plane normal to the main axis and disposed between the planar side surfaces of the rotor. A ring having peripheral gaps therein is mounted on the housing and projects into and substantially occupies the groove. There are axially undulatory walls on the rotor defining a channel forming approximately sinusoidal pockets disposed on opposite sides of the ring and open thereto. The pockets have circumferentially overlapping portions and are circumferentially displaced from each other. The pockets when considered together have a substantially constant axial dimension. Vanes having substantially the same axial dimension are mounted on the housing for pivotal motion through the gaps and in the pockets as impelled by the channel walls. There are ports in the housing on axially opposite sides of the ring and on circumferentially opposite sides of the vanes defining inlet and outlet passages open to the pockets.

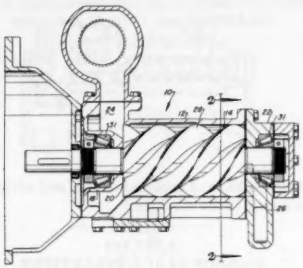
3,787,154
ROTOR PROFILES FOR HELICAL SCREW ROTOR MACHINES

Soren E. H. Edstrom, Quincy, Ill., assignor to Gardner-Denver Company, Quincy, Ill.

Filed May 24, 1972, Ser. No. 256,237
Int. Cl. F01c *21/08*; **F04b** *21/00*
U.S. Cl. 418—201 **15 Claims**

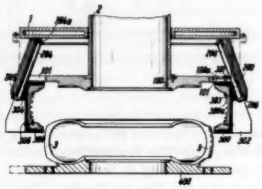
Asymmetric rotor profiles for cooperating helical screw type rotors for use in fluid compressors and motors. One flank of each gate rotor groove is formed partially as a concave curved surface defined by a circular arc having its radius center located outside the pitch circle of the gate rotor. The

radially outermost portions of the gate rotor grooves are formed as convex curved surfaces defined by circular arcs.



The other flank of each gate rotor groove and the flanks of the main rotor lobes are largely formed by traveling generation.

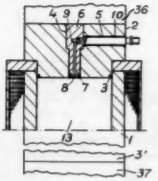
3,787,155
SEGMENTED VULCANISING TIRE MOULD
Karl Zangl, Kantstrasse 10, Munich, Germany
Filed Aug. 1, 1972, Ser. No. 276,904
Int. Cl. B29h *5/08*
U.S. Cl. 425—47 **11 Claims**



The specification describes a vulcanising mould for vehicle tires, comprising a first side wall mould part with radially outwardly extended support arms, a second side wall mould part and a tread mould ring subdivided into radially movable profile segments. The profile segments have conical sliding shoes on their outer surface. These shoes are provided with a surrounding part whose internal surface is conical. The surrounding part serves to produce radial movement of the profile segments when relative axial movement takes place between the surrounding part and the tread mould ring. The axial guide means of the first side wall mould part in the surrounding part comprises recesses in the surrounding part in which the extended carrying arms of the first side wall mould part can be displaced axially. The radial guidance of the sliding shoes of the profile segments is ensured by support screws which can be displaced radially in slots in the support arms.

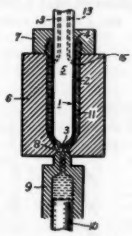
3,787,156
PRESS FOR TREATING PRODUCTS UNDER HIGH ISOSTATIC PRESSURE
Torstein Landa; Paul Johannsson, and Knud Engedal, all of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed May 1, 1972, Ser. No. 249,149
Claims priority, application Sweden, May 6, 1971, 5877/71
Int. Cl. B29b *11/32*
U.S. Cl. 425—77 **4 Claims**

A process for treating products with high pressure includes a high pressure cylinder with end closures projecting thereinto and a press stand. The supply of pressure medium is made through one end closure which includes a cylindrical unit with an axial and a radial channel, applied in an axially arranged recess in the end closure and sealed to the recess at its inner part and a second cylindrical unit with an axial chamber which



is applied in a recess perpendicular to the axial recess and connected to the first unit. This permits the units to be readily interchanged if any part of the unit cracks under the high pressure.

3,787,157
APPARATUS FOR MAKING COMPOSITE PLASTIC ARTICLES
Emery I. Valyi, 5200 Sycamore Ave., New York, N.Y.
Continuation-in-part of Ser. No. 71,734, Sept. 14, 1970, Pat. No. 3,717,544, and a continuation-in-part of Ser. No. 100,050, Dec. 21, 1970, Pat. No. 3,719,735. This application Oct. 6, 1971, Ser. No. 186,984
Int. Cl. B29d *23/03*
U.S. Cl. 425—112 **9 Claims**

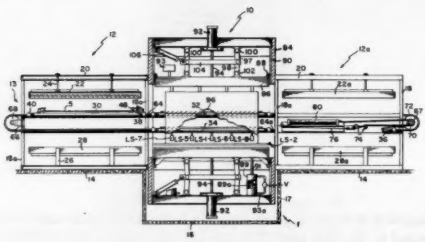


Plastic articles and apparatus for making the same in which a preformed sleeve is placed over a core, a parison is injected around the core and sleeve in a parison mold and the parison is blown in a blow mold together with the sleeve.

3,787,158
TWIN SHEET THERMOFORMER
Gaylord W. Brown, and George L. Pickard, both of Beaverton, Mich., assignors to Koehring Company, Milwaukee, Wis.
Filed July 3, 1972, Ser. No. 268,883
Int. Cl. B29c *17/04, 3/06*
U.S. Cl. 425—156 **8 Claims**

Thermoforming apparatus having a pair of plastic sheet heating stations, each including upper and lower heaters, on opposite sides of a differential pressure forming station, upper and lower plastic sheet supporting carriages for supporting upper and lower pairs of plastic sheets of differing thicknesses; transfer apparatus for shuttling the upper carriages to alternate ones of the heating stations while concurrently moving alternate ones of the lower sheets to opposite ones of the heating stations so that two of the upper and lower sheets are

simultaneously heated, one in each heating station, while the other two upper and lower sheets are concurrently superposed at the forming station where they are formed into a hollow article by differential pressure forming apparatus at the forming station, and control apparatus for alternately operating the



upper and lower heaters at each heating station for longer and shorter periods of time while the upper and lower heaters at the other station are being operated for shorter and longer periods of time respectively to subject the plastic sheets which are alternately moved to the heating stations to different amounts of heat.

3,787,159

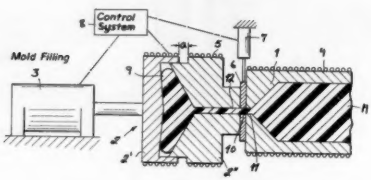
APPARATUS FOR INJECTION MOLDING WITH THERMOSETTING RESINS

Friedrich Bernd Bielfeldt, Pappenheim, Germany, assignor to Eckert & Ziegler G.m.b.H., Weissenburg, Germany

Division of Ser. No. 852,025, Aug. 21, 1969, Pat. No. 3,632,729. This application May 3, 1971, Ser. No. 139,846

Int. Cl. B29f *1/06*

U.S. Cl. 425—167 **1 Claim**



A thermosetting resin is injected into a partially open separable mold having a mold cavity. This mold is then partially closed to precompress the resin and is heated to soften it. After a predetermined amount of time, the mold is fully closed to compress the mass of resin and to force it into every portion of the cavity. A telescoping mold and a valve between the mold and the injection head are used to prevent the mass from escaping during compression.

3,787,160

APPARATUS HAVING EXTRUSION AND MIXING ZONES

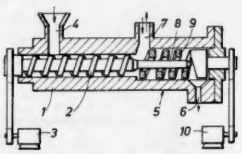
Karl Leister, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 69,486, Sept. 3, 1970, abandoned, which is a continuation-in-part of Ser. No. 1,678, Jan. 9, 1970, abandoned. This application Sept. 11, 1972, Ser. No. 288,222

Int. Cl. B29f *3/02*

U.S. Cl. 425—208 **11 Claims**

Apparatus for extruding and mixing of material comprising an extrusion zone, into which the material is introduced, and a mixing zone, into which the material is extruded. In the mixing zone, a core member and a worm helix are driven indepen-



dently of each other and mix the material and advance it to the discharge nozzle of the machine.

3,787,161

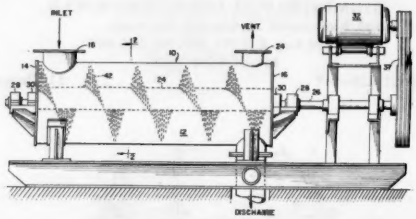
CARBON BLACK PELLETIZER

James A. Frye, Oklahoma City, and Ralph B. Morton, Del City, both of Okla., assignors to The Boardman Company, Oklahoma City, Okla.

Filed May 25, 1972, Ser. No. 256,851

Int. Cl. B29b *1/02*

U.S. Cl. 425—222 **7 Claims**



A carbon black, and the like, pelletizer having a rotor with a multiplicity of flat, bladelike toolholders attached to a rotatable shaft and each mounting at the end thereof a pelletizing tool in the nature of a pin. The toolholders are so designed and arranged as to effectively form a helix, in conjunction with the pins, for advancing the material during pelletizing to an outlet, and one embodiment provides a double helix for substantially working all of a product at all times.

3,787,162

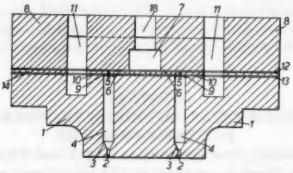
CONJUGATE FILAMENTS APPARATUS

John Laurence Cheetham, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 13, 1972, Ser. No. 243,878

Int. Cl. D01d *3/00*

U.S. Cl. 425—463 **1 Claim**



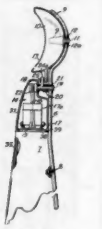
Process and apparatus for sheath/core conjugate filaments in which a jet of a first fiber-forming polymer is forced into confined space, second fibre-forming polymer is forced around first polymer from one side and polymers are extruded to form filaments. Preferably the ducts for first and second polymers are formed in part by appropriate apertures in metal shims.

3,787,163

POWERED ICE CREAM DIPPER

Neil E. Denison, 300 S. Straughan, Apt. 704, Boise, Idaho, and Edward E. McCullough, Box 46, Brigham City, Utah

Filed Dec. 29, 1971, Ser. No. 213,263
Int. Cl. A23g 5/02
U.S. Cl. 425—280 9 Claims



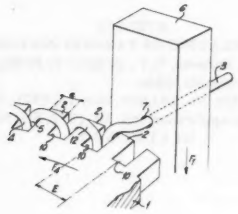
Dipper apparatus that fits as an attachment on an electric knife handle has an arm, rigidly attachable thereto, that pivotally holds a scoop member, and means for transferring reciprocating motion from the actuators in the knife handle to the scoop, whereby it may be rotated through a small arc. The scoop member is preferably less than hemispherical, being laterally narrowed. It also has sharpened and serrated edges, and may be electrically heated to facilitate removal of ice cream therefrom.

3,787,164

DEVICE FOR THE MANUFACTURE OF A ROW OF LINKING COMPONENTS FOR A SLIDE FASTENER

Horst Jakob, Choisy-le-Roi, France, assignor to Societe Financiere Francaise De Licenses Et Brevets, Chosy-le-Roi, France

Filed Oct. 5, 1971, Ser. No. 186,612
Claims priority, application France, Oct. 8, 1970, 7036379
Int. Cl. B29c 17/00
U.S. Cl. 425—397 3 Claims



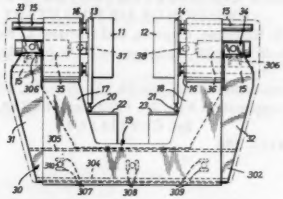
In a known process and apparatus for the production of a continuous row of linking components for a slide fastener, using a plastics thread, the plastics thread is shaped into a spiral over and between a series of studs by means of a thread guide. One of the ends of each whorl of the spiral is crushed by means of a punch to form a linking component, whilst holding the corresponding whorl between the studs. The invention provides the improvement in that, on the crushing-point side of each whorl, the corresponding portion of the thread is stretched out rectilinearly beyond the crushing point and facing the corresponding side face of the thread guide. The required point of the thread is then crushed against the thread guide, which is used as an anvil, the punch used being independent of the other working tools, and the folding back of the corresponding portion of the thread being performed only after the crushing has been carried out.

3,787,165

SUPPORT DEVICE FOR A MOULDING PRESS

Stefan Fischer, Im Korresgarten 21, and Rainer Fischer, Am Wildtor 2, both of Lohmar (Bez. Koln), Germany

Filed Sept. 30, 1968, Ser. No. 763,500
Claims priority, application Germany, Sept. 30, 1967, P 17 04 046.9
Int. Cl. B29c 3/00
U.S. Cl. 425—450 10 Claims



This invention relates to a support device for use in combination with a molding press, which support serves to contain the forces exerted by the clamping together of the molds affixed to the platens of such press.

3,787,166

PROCESS FOR THE THERMAL TREATMENT OF RUBBER AND OTHER PLASTIC MATERIALS

Franz Schaub, Oberhausen, and Sebastian Speth, Duisburg, both of Germany, assignors to Ruhchemie Aktiengesellschaft, Oberhausen-Holten, Germany

Filed Jan. 29, 1973, Ser. No. 327,701
Claims priority, application Germany, Feb. 3, 1972, 2205001
Int. Cl. F23d 11/44
U.S. Cl. 431—11 9 Claims

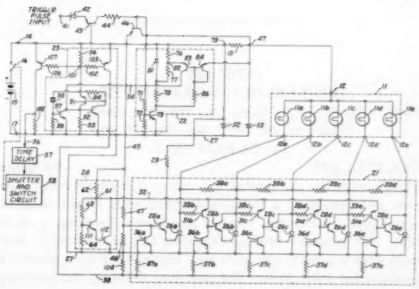
Wastes of the group comprising synthetic plastics and rubber are thermally disposed of by cracking at temperatures between 250° and 450°C. The cracking may be carried out in the presence of an auxiliary medium which is in the liquid state at the reaction temperature and capable of dissolving the wastes and/or the cracking products at least partially. The thermal decomposition may be accelerated by the addition of catalysts.

3,787,167

CURRENT-SENSING CIRCUIT FOR DETERMINING FLASHING OF A PHOTOFLASH LAMP

Donald L. Watrous, Liverpool, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 24, 1972, Ser. No. 299,653
Int. Cl. F21k 5/02
U.S. Cl. 431—95 8 Claims



The inputs of a differential amplifier are connected across a current-sensing resistor that is connected in series with an

array of flash lamps adapted to be sequentially flashed, one at a time per flash picture. The differential amplifier produces an output signal in response to current flow to a lamp being flashed. An enabling circuit prevents the differential amplifier from consuming battery current until a trigger signal occurs to initiate flashing of a lamp, and a diode voltage reference circuit improves the accuracy of operation.

3,787,168

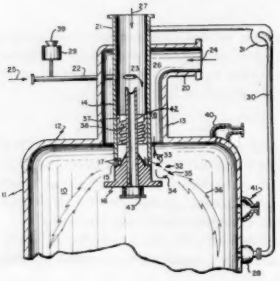
BURNER ASSEMBLY FOR PROVIDING REDUCED EMISSION OF AIR POLLUTANT

Richard R. Koppang, Cypress, and Harland L. Burge, Jr., Tarzana, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 91,333, Nov. 20, 1970. This application Aug. 23, 1972, Ser. No. 283,197

Int. Cl. F23d *13/40*

U.S. Cl. 431—354 **5 Claims**



A pair of conduits, coaxially arranged, provide flow paths for carrying combustible reactants to a combustion zone. The central conduit, otherwise known as a distribution tube, extends to within the combustion zone and includes a disc element at the combustion zone end thereof for deflecting an oxidizing reactant moving axially along the exterior of the distribution tube. A fuel reactant introduced into the distribution tube is carried to the combustion zone end thereof where it issues through radial ports and impinges the oxidizing reactant to produce a hollow cone flame. Additionally, a mixing element is included within the distribution tube to impart centrifugal motion to liquid fuels which are then subject to being atomized in the region of the radial ports. Temperature conditioning of the fuel-atomizing gas may optionally be performed to reduce liquid fuel surface tension and to promote vaporization.

3,787,169

HIGH VELOCITY GAS IGNITER

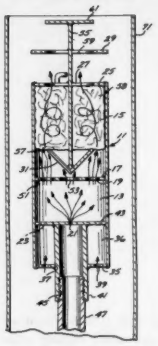
Erwin G. Gjerde, 14095 Nona Ln., Whittier, Calif.

Filed Oct. 20, 1972, Ser. No. 299,444

Int. Cl. F23d *13/12*

U.S. Cl. 431—347 **9 Claims**

A high velocity gas igniter for use in a high velocity flow stream and including a housing formed with axially aligned primary and secondary mixing chambers forming a flow stream. The primary mixing chamber has an upstream wall formed with a central gas inlet port surrounded by a plurality of primary air inlet ports. The partition dividing the primary and secondary chamber is formed with velocity reduction orifices having a relatively small composite cross-sectional flow area and the downstream end of such secondary chamber is in the form of an annular pressure drop ring forming a central outlet having a relatively large cross-sectional flow area. A vortex plate is disposed in confronting relationship with the velocity reduction ports for inducing mixing together of the air



and gas, and a deflecting vane projects from the outlet to deflect the flow stream around such outlet port. Further, a flame retention ring is disposed in confronting relationship with and spaced from the outlet port to form a relatively protected flame retention zone. Thus, the gas port may be connected with a gas supply conduit and pressurized combustible gas applied thereto to initiate flow through the primary mixing chamber to draw ambient air through the air inlet port for initial mixing in the primary mixing chamber and flow through the pressure reduction orifices to impinge on the vortex plate to induce further mixing in the secondary mixing chamber. The relatively low pressure mixture flowing from the outlet port may be ignited to form an igniting flame and the entire igniter disposed in a high velocity flow stream.

3,787,170

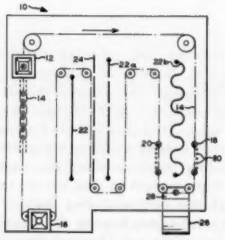
RAPID HEATING OF PARISON PREFORMS

Dixie E. Gilbert, Pomona, N.Y., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 143,006, May 13, 1971, Pat. No. 3,715,109. This application Oct. 20, 1972, Ser. No. 299,388

Int. Cl. F27b *9/24*

U.S. Cl. 432—5 **6 Claims**



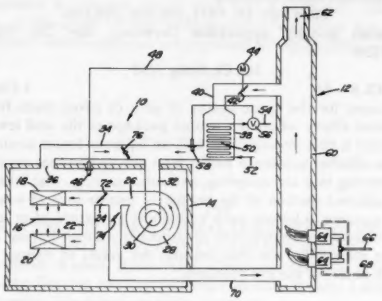
Tubular parison preforms are heated to orientation temperature by means of external radiant heat combined with affirmative heating of the parison on the inside.

3,787,171

CLOSED LOOP, INERT ATMOSPHERE, PAINT LINE OVEN HEAT SOURCE

Theodore Q. Cromp, Placentia, Calif., assignor to Hunter Engineering Co., Inc., Riverside, Calif.

Filed June 15, 1972, Ser. No. 262,969
Int. Cl. F27b *9/28*
U.S. Cl. 432—72 **7 Claims**



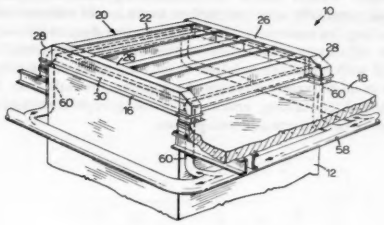
A paint line oven and heat source comprising a stack having fuel-fired burners in the lower portion thereof, and a closed loop conduit system with a circulating blower therein, which takes hot, inert stack gas from the stack above the burners, and circulates it through the oven, where paint solvent is evaporated from the painted product. Solvent-laden oven atmosphere is discharged into the stack below the burners and mixes with excess air supplied through the burners, where the solvent burns, adding its heat to the heat of the burners. Stack atmosphere at the conduit intake is substantially oxygen-free, and is hotter than the predetermined oven temperature. A water-cooled heat exchanger in the conduit cools the stack atmosphere down to the preselected oven temperature before discharging it into the oven. In one embodiment, temperature-controlled valves regulate the volume of stack atmosphere delivered to the oven, and the rate of flow of coolant in the heat exchanger, so that uniform temperature is maintained automatically.

3,787,172

REFRACTORY FURNACE

Andrew G. Sanderson, 178 Patton St., King City, Ontario, Canada

Filed Apr. 2, 1973, Ser. No. 346,954
Claims priority, application Canada, May 11, 1972, 141864
Int. Cl. F27b *3/16*
U.S. Cl. 432—250 **5 Claims**



A refractory furnace having a cover resting on supports outside the furnace and sealed by an air curtain, in which the peripheral duct in the cover frame supplying the air curtain is fed through the support means from a remote source of pressurized air.

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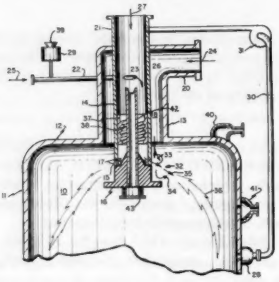

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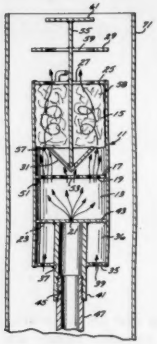

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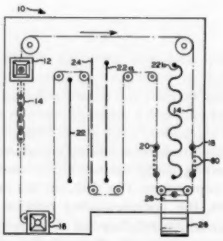
Int. Cl. F27b *9/24*
U.S. Cl. 432—5 **6 Claims**



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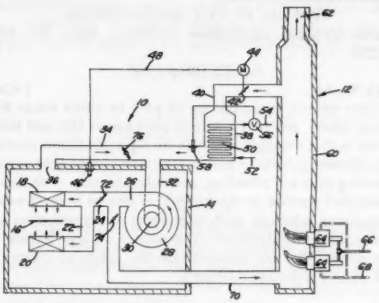
Int. Cl. F27b 9/28
U.S. Cl. 432—72 **7 Claims**



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Int. Cl. F27b 3/16
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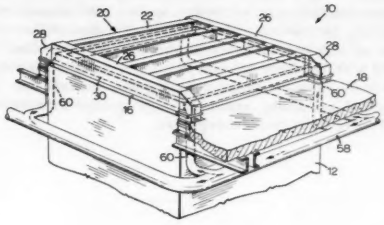


A refractory furnace having a cover resting on supports outside the furnace and sealed by an air curtain, in which the peripheral duct in the cover frame supplying the air curtain is fed through the support means from a remote source of pressurized air.

3,787,173

NEW COLOURATION PROCESS

James Nairn Greenshields; Ida May Jones; John Lewis Moilliet, and Victor David Poole, Manchester, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 7, 1972, Ser. No. 232,640

Claims priority, application Great Britain, Mar. 30, 1971, 8161/71; Dec. 15, 1971, 58227/71

Int. Cl. D06p *1/38*

U.S. Cl. 8—1 E 5 Claims

Colouration of textile materials capable of forming hydrogen bonds with amines, especially cellulosic or cellulose/polyester union materials, by impregnating the material with a water-soluble or water-dispersible compound of molecular weight above 600 containing amino or imino groups, especially a poly(ethylene imine), and subsequently contacting the material with a fibre-reactive dye; or a modification of this process wherein the material is padded or printed with a padding solution or printing paste containing a water-in-oil-in-water emulsion having the dyestuff and the compound containing amino or imino groups dissolved or dispersed in separate aqueous phases.

3,787,174

DIPHENYLAMINES FOR DYEING KERATINOUS FIBERS

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

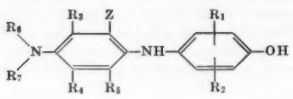
Continuation-in-part of Ser. No. 61,833, Aug. 6, 1970. This application July 11, 1972, Ser. No. 270,650

Claims priority, application Luxembourg, Aug. 11, 1969, 59265

Int. Cl. D06p *1/32*; C07c *91/42*

U.S. Cl. 8—11 15 Claims

Diphenylamines of the formula



wherein R_1 and R_2 each independently represent hydrogen, halogen or lower alkyl containing one to four carbon atoms with at least one of R_1 and R_2 being other than hydrogen; R_3, R_4, R_5, R_6, and R_7 each independently represent hydrogen, methoxy, or lower alkyl optionally substituted with hydroxy, carbamyl, piperidinyl or acylamino; R_3 and R_6 or R_4 and R_7 also optionally forming together with the carbon and nitrogen atoms to which they are attached, a dihydrooxazine or pyrroline heterocycle; and Z represents amino, acylamino or hydroxy; and the acid salts of said diphenylamines. These diphenylamines are usefully employed in cosmetic compositions for the hair including hair dye compositions and hair setting lotion compositions.

3,787,175

SPACE-DYEING CELLULOSE FIBERS BY IMPREGNATING WITH MIXTURE OF DIAZONIUM

Hans-Ulrich Von der Eltz, and Doris-Jutta Fink, both of Frankfurt/Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Nov. 18, 1971, Ser. No. 200,166

Claims priority, application Germany, Nov. 20, 1970, 2057230

Int. Cl. D06p *3/68*

U.S. Cl. 8—14 1 Claim

Process for the space-dyeing of yarn or sliver made from cellulose fibers, wherein a wound package of the said textile material is first impregnated with an aqueous liquor containing an alkaline substance and at least one component capable of entering into azo coupling, and subsequently — at least at one selected portion of the bobbin — one or several weakly acid aqueous solutions each containing a mixture of at least two diazonium compounds of aromatic amines having different diffusibility are injected into the goods so treated for development of the azo dyestuffs.

3,787,176

PROCESS FOR SPACE-DYEING OF CELLULOSE FIBERS

Hans-ulrich von der Eltz, and Doris-Jutta Fink, both of Frankfurt/Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Nov. 18, 1971, Ser. No. 200,191

Claims priority, application Germany, Nov. 20, 1970, 2057236

Int. Cl. D06p *1/12*; D06p *1/14*

U.S. Cl. 8—14 2 Claims

Process for the space-dyeing of yarn or sliver made from cellulose fibers, wherein a wound package of the said textile material is first impregnated with an aqueous liquor containing an alkaline substance and at least one component capable of entering into azo coupling, then — at least at one selected portion of the bobbin — one or several acid aqueous solutions each containing at least one diazonium compound of an aromatic amine and at least one phthalocyanine dyestuff having quaternary ammonium groups are injected, and finally the goods so treated are exposed to the action of heat for fixation of the phthalocyanine dyestuffs and for development of the azo dyestuffs.

3,787,177

AROMATIC POLYESTER TEXTILE FIBERS DYED WITH NAPHTHYLOXYANTHRAQUINONE DYES

Guido R. Genta, Lock Haven, Pa., assignor to American Aniline Products, Inc., Patterson, N.J.

Division of Ser. No. 75,705, Sept. 25, 1970. This application Jan. 4, 1973, Ser. No. 320,845

Int. Cl. D06p *3/52*

U.S. Cl. 8—39 3 Claims

New anthraquinone dyes, 1-amino-2-naphthyloxyalkoxy-4-hydroxy anthraquinones, are provided. Synthetic textile fibers, in particular, polyethylene terephthalate fibers, when dyed with the new dyes, are colored in bright pink shades which are substantive, light fast, and sublimation resistant.

3,787,178

POLYESTER TEXTILE FIBERS DYED WITH THIAZOLE OR BENZOTHIAZOLE CARBAZOLE DYES

Edgar Earl Renfrew, Lock Haven, Pa., assignor to American Aniline Products, Inc., Lock Haven, Pa.

Filed Feb. 28, 1972, Ser. No. 230,111
Int. Cl. D06p *3/52*; C09b *29/36*
U.S. Cl. 8—41 C 3 Claims

A new series of azo dyes is produced by coupling a diazotized heterocylic amine base with a carbazole coupler. The compounds of the invention are excellent dyes for polyester fabrics and also are pigments for rigid plastic materials.

3,787,179

PROCESS FOR THE MANUFACTURE OF INSOLUBLE AZO DYESTUFFS ON CELLULOSE FIBERS

Lowenfeld, Rudolf, Buchschlag, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Dec. 10, 1971, Ser. No. 206,904
Claims priority, application Germany, Dec. 12, 1970, 2061357
Int. Cl. D06p *1/12*; C09b *27/00*
U.S. Cl. 8—45 3 Claims

Process for the preferably continuous manufacture of water-insoluble azo dyestuffs on textile materials made of cellulose fibers, which comprises carrying out, after the application of the coupling component and of the diazo component from an aqueous dye bath, the finishing operation of the dyeings in organic solvents. The diazo component is in the form of a diazo-amino compound capable of being split up or of an anti-diazotate of a primary aliphatic amine. The organic solvent a hydrocarbon which may be halogenated, aromatic or cycloaliphatic.

3,787,180

PROCESS FOR THE NON-AQUEOUS CONTINUOUS DYEING AND PRINTING OF FIBRE MATERIAL MADE FROM SYNTHETIC POLYAMIDE

Hans Wegmuller, Riehen, and Alois Kleemann, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Apr. 9, 1971, Ser. No. 132,809
Claims priority, application Switzerland, Apr. 10, 1970, 5312/70
Int. Cl. D06p *1/68*
U.S. Cl. 8—172 12 Claims

A process for the non-aqueous, continuous dyeing or printing of synthetic polyamide fibre material is disclosed, which comprises impregnating or printing this material with a solution of at least one dye salt consisting of the anionic radical of an anionic dyestuff and the cationic radical of an isothiourea derivative capable of salt formation, in a halogenated aliphatic hydrocarbon, optionally containing thickener, on its own or in admixture with a liquid, water-soluble organic solvent, removing excess dye liquor from the material and fixing the dyestuff by a heat treatment of the impregnated or printed fibre material at temperatures below the softening point of the fibre material, thereby obtaining a finished dyeing or print on said fibre material. By this process, on the stated fibre material are obtained deeply coloured, even and well developed dyeings having good fastness properties, such as fastness to wet processing, rubbing and dry cleaning.

3,787,181

DYEING SYNTHETIC HYDROPHOBIC FIBERS WITH LOWER ALKYL BIPHENYL CARRIERS

Kurt A. Dellian, Spring Valley, N.Y., and Samuel Lee, Fairlawn, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 29, 1971, Ser. No. 158,082
Int. Cl. D06p *1/68*
U.S. Cl. 8—174 6 Claims

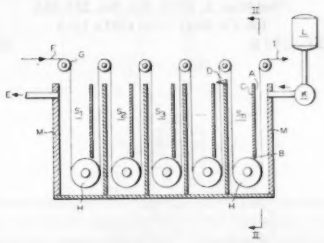
A technique for coloring hydrophobic textile fibers with a disperse or basic dyestuff utilizing an alkyl biphenyl carrier.

3,787,182

PROCESS FOR THE DYEING OF TOW IN HYDRATED CONDITION

Gottfried Eigenmann, Therwil; Leo E. Kaiser, Aesch, and Otto Nothiger, Oberwil, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 150,754, Dec. 22, 1970, abandoned. This application Oct. 31, 1972, Ser. No. 302,504
Claims priority, application Switzerland, Dec. 23, 1969, 19173/69
Int. Cl. D06p *3/70*
U.S. Cl. 8—177 1 Claim



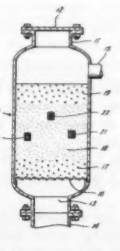
A process for the continual dyeing of fibres produced by a wet spinning process, in particular for the continual dyeing of polyacrylonitril tow in a hydrated condition is disclosed in that the fibre or the fibre strand after fibre formation without previous drying is passend through a dyestuff solution or suspension which is flowing in counter current. Said process is very economical and provides without the use of any electronic controls the continual dyeing of said fibres with almost 100 percent exhaustion.

3,787,183

METHOD OF ANALYZING CATALYST ACTION

Alvin B. Kennedy, Jr., Alvin, Tex., assignor to Catalyst Services, Inc., Alvin, Tex.

Filed Feb. 9, 1972, Ser. No. 224,733
Int. Cl. B01j *9/04*; G01n *1/00, 31/10*
U.S. Cl. 23—230 R 8 Claims



Small samples of catalyst are individually segregated in durable perforate containers located at known positions

within the main body of catalyst. After a suitable period of time the samples are individually analyzed to determine the effect thereon of the process.

3,787,184

METHOD AND COMPOSITION FOR DETECTING AMINE COMPOUNDS

Thaddeus J. Novak, and Edward J. Poziomek, both of Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 23, 1970, Ser. No. 24,918
Int. Cl. G01n *31/00*
U.S. Cl. 23—230 R **7 Claims**

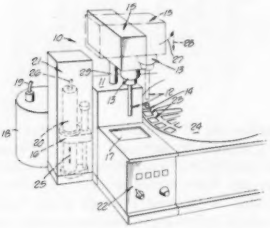
A method for detecting nitrogen containing compounds the steps comprising contacting a sample comprising said compounds with a signalling composition containing a capped copolymer and dye and producing a visible detecting signal.

3,787,185

DISRUPTOR MODULE

Donald Gene Rohrbaugh, Santa Ana; Everett James Petersen, Jr., Glendora, and Charles Peter Chase, Brea, all of Calif., assignors to Beckman Industries, Inc., Fullerton, Calif.

Filed Mar. 2, 1972, Ser. No. 231,268
Int. Cl. B01f *1/00*; G01n *1/10*
U.S. Cl. 23—253 R **15 Claims**



An automated device on signal serially dispenses a precise solvent volume into an individual chemical sample reactor module containing a single sample solid composition, provides agitation for disrupting and dissolving the sample, and supplies an aliquot filtered solution sample. The tablet disruptor device functioning in the reactor module is automatically programmed to disrupt the sample and to stir and dissolve it in the turbulent solvent. The disruptor device is then solvent washed, prior to being utilized again in the serialization disruption and solution of successive samples in successive solvent volumes in individual chemical reactor sample modules.

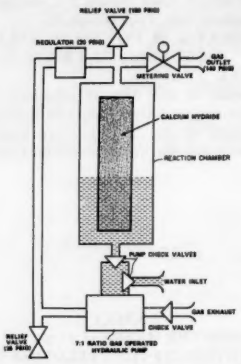
3,787,186

CALCIUM HYDRIDE GAS GENERATOR

Robert J. Geres, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1972, Ser. No. 222,833
Int. Cl. B01j *7/02*; C10h *5/00*
U.S. Cl. 23—282 **5 Claims**

A differential area gas operated hydraulic pump used in a bootstrap mode to pump water into a reaction chamber Water is pumped into the reaction chamber until the level reaches a quantity of calcium hydride (CaH_2) and reacts to produce just enough gas to exceed the operating pressure, whereupon the pump will stall. No further hydrolysis takes



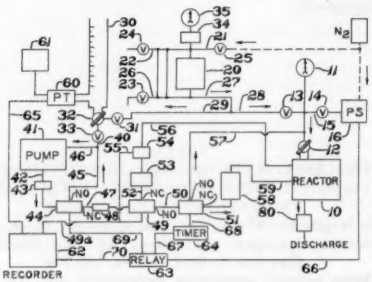
place until the chamber pressure is relieved at which time the pump again operates to raise the water level into contact with unreacted CaH_2.

3,787,187

CONVERSION-CONTROLLED APPARATUS FOR POLYMERIZATION OF MONOMERIC MATERIALS IN LIQUID MEDIA

Elmer J. De Witt, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, New York, NY

Filed Apr. 1, 1970, Ser. No. 24,476
Int. Cl. C08f *1/98*
U.S. Cl. 23—285 **2 Claims**



Improved apparatus for polymerizing liquid monomeric materials in liquid reaction media include a reaction vessel communicating with one or more liquid and/or vapor supply vessels and a pressure-sensing flow-control means associated with the reaction vessel which operates to control the supply of one or more liquids from the supply vessel or vessels to the reaction vessel in response to shrinkage of the charge therein attending conversion of liquid monomer to solid polymers as polymerization proceeds thereby maintaining the reaction vessel in an essentially completely-filled condition. A sensing device or devices such as a pressure- or weight-sensitive transducer associated with one or more of the supply vessels senses the weight or volume of liquid thus delivered to the reaction and is employed to initiate the addition from a supply to the reaction vessel of a liquid or gaseous short stop material yielding automatic and accurate termination of the polymerization reaction at a predetermined degree of conversion. Where two or more liquid supply vessels are thus employed, a proportion-

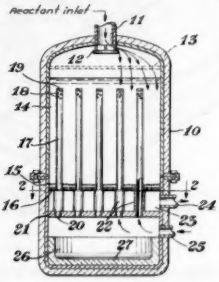
ing device operated by the pressure-sensing flow-control means can be employed to effect a division of the total liquid delivered to the reaction vessel in any predetermined proportion between two or more different liquids such as between liquid monomers and aqueous medium or between two liquid monomers thus effecting control of the composition of the medium in the vessel as polymerization proceeds.

3,787,188

APPARATUS FOR CATALYTIC REACTIONS

George W. Lyon, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 26, 1971, Ser. No. 202,375
Int. Cl. B01j *9/04*; **C07c** *15/02, 15/10*
U.S. Cl. 23—288 R **6 Claims**



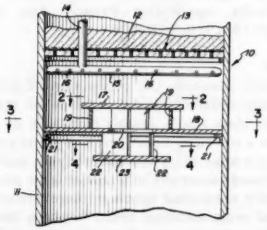
A catalytic reactor has separate inlet ports for a hydrocarbon stream which is to be dehydrogenated and for a heated fluid stream which maintains the reaction temperature such that the hydrocarbon and the heat maintaining fluid are mixed in the presence of catalyst. One of the streams flows through the catalyst linearly and the other flows radially. The method of dehydrogenating ethyl benzenes and ring substituted derivatives thereof to the corresponding styrenes using a hot fluid stream as a means for maintaining the reaction temperature, and using the above reactor, reduces the cracking of the ethyl benzenes and corresponding styrenes to benzene and its homologs and to carbonaceous products.

3,787,189

APPARATUS FOR MIXING FLUIDS IN A VESSEL BETWEEN BEDS OF SOLIDS

Donald L. Muffat, Lansing, Ill.; John B. Clark, Hammond, and Lyle M. Lovell, Portage, both of Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 17, 1971, Ser. No. 209,290
Int. Cl. B01j *9/04*; **B05b** *1/26*
U.S. Cl. 23—288 R **19 Claims**



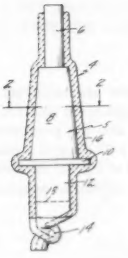
The apparatus comprises a plurality of baffles positioned in the vessel so as to be perpendicular to the flow of fluids through said vessel and a plurality of sets of swirl vanes that are assembled in such a manner that a fluid medium being introduced into the vessel between beds of solids will be intimately admixed with other fluids that are passing through the vessel from one bed of solids to another.

3,787,190

DIRECTIONALLY SOLIDIFIED ARTICLE

Anthony F. Giamei, Middletown; Merton F. Hornbecker, Woodbury, and Bruce E. Terkelsen, Cheshire, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Division of Ser. No. 42,423, June 1, 1970, Pat. No. 3,627,015.
This application Sept. 16, 1971, Ser. No. 181,184
Int. Cl. B22f *5/00*
U.S. Cl. 29—183 **4 Claims**



Unidirectionally solidified articles either columnar grained or single crystal are investment cast by enclosing the mold for the articles in a surrounding mold arranged to make a control casting of two separable parts located on opposite sides of the article cast in the article mold. This permits more precise control of the thermal gradient in the article mold during solidification of the cast material and provides removal of the cast article from the surrounding material.

3,787,191

METHOD OF PRODUCING REFLECTIVE SURFACES AND ARTICLE

Leon L. Duncan, 811 Duncan Ave., Washington, Mo.

Continuation-in-part of Ser. No. 840,442, July 9, 1969, abandoned, which is a continuation-in-part of Ser. No. 804,364, Feb. 25, 1969, Pat. No. 3,545,996, which is a continuation of Ser. No. 332,230, Dec. 20, 1963, abandoned.
This application Mar. 3, 1971, Ser. No. 120,663
Int. Cl. C23b *5/48*
U.S. Cl. 29—191 **10 Claims**

Electroplating a metal surface which has previously been, or is thereafter peened with high velocity, microscopic, spherical glass bodies to produce microscopic craters thereon, and optionally, removing a portion of the plating so peened by dissolving same with acid. By plating an already peened surface with a reflective material, the zone and/or intensity of reflectivity of the plated surface is increased and/or controlled.

3,787,192

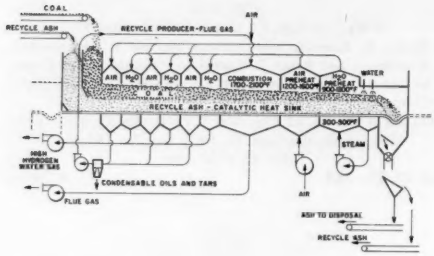
PROCESS FOR COAL GASIFICATION

Thomas E. Ban, South Euclid, Ohio, assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio

Filed Mar. 2, 1972, Ser. No. 231,354
Int. Cl. C01j *3/06*; **C10j** *3/16*
U.S. Cl. 48—202 **10 Claims**

There is provided a process for producing water gas containing a large quantity of hydrogen and involving the forma-

tion of a moving quiescent gas-permeable bed composed of both particles of coal and particles of spent coal or ash. The bed is passed through a series of zones in which, in a succession of cycles, the bed is permeated with an oxygen-containing gas preheated to a predetermined temperature and then a moisture-laden gas also preheated to a predetermined temperature. These gases are collected separately after they traverse the moving quiescent bed. The water gas may be used as an industrial gas, and the producr-flue gas resulting from the portions treated with oxygen-containing gas may be recycled through the bed at a point downstream. The process provides a continuous economic procedure for gasification of coal.

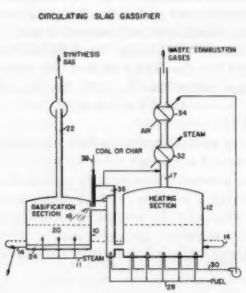


3,787,193

PRODUCTION OF WATER GAS

Leonard Seglin, New York, N.Y., and Charles A. Gray, Charleston, W. Va., assignors to FMC Corporation, New York, N.Y.

Filed Nov. 18, 1971, Ser. No. 200,152
Int. Cl. C10j *3/00*
U.S. Cl. 48—204 **3 Claims**



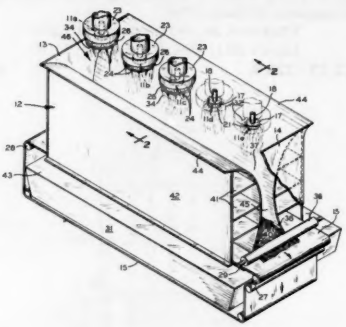
Water gas is produced by blowing steam through carbon suspended in a coal ash melt in a gasification section, the endothermic heat of reaction being supplied by the ash melt, which is continuously recirculating through a separate superheating section where the ash is superheated by burning fuel separately introduced into that section; the superheated ash is then conveyed to the gasification section, substantially free of oxidative gas, preferably by means of a heated gas lift.

3,787,194

COLLECTION CHAMBER FOR MAKING MATS OF INORGANIC FIBERS

Brian James Rayle, Toledo, Ohio; Lester Fisher, Centerville, and Harvell Morton Smith, Richmond, both of Ind., assignors to Johns-Manville Corporation, Greenwood Village, Arapahoe County, Colo.

Filed May 16, 1972, Ser. No. 253,708
Int. Cl. C03b *37/04*
U.S. Cl. 65—9 **8 Claims**



A collection chamber located between a source of gas entrained inorganic fibers and a collection surface upon which mats of the fibers are formed. The side walls of the chamber in various configurations enhance the mixing of cooling gas, binder and the entrained fibers while reducing turbulence and enhancing control of fiber deposition. Divergent side walls above the collection surface diffuse the binder coated fiber and reduce its velocity so that it is deposited in a blanket of uniform density and thickness across the collection surface. Convergent side walls from a region adjacent the fiber source reduce turbulence and back flow in this region while facilitating the mixing of cooling air with the hot fiber entraining, high velocity blast, and the distribution of binder in the mixed fiber-gas stream. A collection chamber having walls of the general form of a hyperbola is disclosed with given height, width of collection surface, throat dimensions and throat location relationships for superior results. Compromise collection chamber forms to accommodate plant and equipment restrictions are discussed.

3,787,195

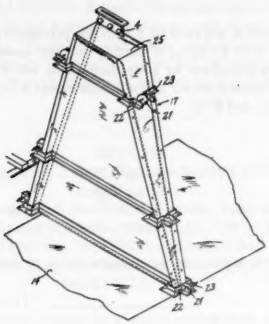
APPARATUS FOR THE PRODUCTION OF SHEETS OR MATS FROM FIBERS OF THERMOPLASTIC MATERIAL

Jean-Jacques Kirchheim, Saint-Maur-des-Fosses, France, assignor to Saint-Gobain, Neuilly-Sur-Seine, France

Filed Apr. 21, 1971, Ser. No. 136,132
Claims priority, application France, Apr. 29, 1970, 70.15678; Sept. 18, 1970, 70.33876
Int. Cl. C03b *37/06*
U.S. Cl. 65—9 **17 Claims**

The invention concerns the production of homogeneous and structurally resistant sheets or mats of thermoplastic fibers, such as glass fibers, issuing from one or more spinnerettes above a travelling conveyor. The fibers are deposited on the conveyor after being blown through a stationary skirt or conduit formed essentially of a pair of large plane surfaces having critically controlled spacings therebetween to attain predetermined cross-sectional areas between the inlet and outlet end of the conduit, as well as adjustable outlines of the outlet. These variable and/or adjustable sectional areas serve to control the pattern and area of deposition of the fibers on the conveyor. A plurality of spinnerettes and guide conduits

may be arranged in different patterns and alignments relative to the direction of travel of the conveyor to control the laying-up of the fibers and consequently the physical characteristics of the deposited mat. Additional trapezoidally shaped shaping members, also each formed essentially of a pair of large plane surfaces with an inlet and outlet, as well as intermediate sections of predetermined or adjustable areas, may be used in lieu



of or in conjunction with the above-mentioned skirts or conduits. These shaping members are fitted with openings and/or blowers for air or gaseous currents to afford a convenient control of the entrainment of the dropping fibers passing therethrough, which discharge from the outlet ends of said members, which are spaced a slight distance above the travelling conveyor.

3,787,196

APPARATUS FOR FEEDING GOBS OF MOLTEN VITREOUS OR PLASTIC MATERIAL INTO MOLDS OF A MACHINE FOR FORMING BOTTLES OR SIMILAR CONTAINERS WITH CONTROL MEANS FOR CONTROLLING THE MOVEMENT OF THE MOLDS

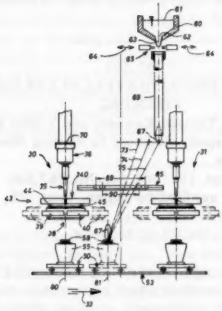
Kurt Becker, Obernkirchen, and Hans-Georg Seidel, Rinteln, both of Germany, assignors to Hermann Heye, Obernkirchen, Germany

Division of Ser. No. 163,171, July 16, 1971, abandoned. This application Mar. 1, 1973, Ser. No. 337,193

Claims priority, application Germany, July 20, 1970, 2035926

Int. Cl. C03b *5/30*

U.S. Cl. 65—164 **13 Claims**



Apparatus for feeding gobs of molten vitreous or plastic material into molds of a machine for forming bottles or similar containers from such material in which the molds are moved along an endless path past a loading station at which gob-feeding means are stationarily arranged above the path of the molds, and in which each mold is momentarily arrested when axially aligned with the gob-feeding means so that a gob may be dropped in vertical direction into the respective mold. The molds are transported along a major portion of the endless path with uniform speed equally spaced from each other, but upstream and downstream of the loading station decelerated or accelerated in such a manner so as to arrive at a point downstream of the loading station at the same time as if they would have been moved continuously with said uniform speed.

3,787,197

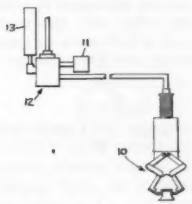
APPARATUS FOR INTRODUCING MEASURED VOLUMES OF GASES TO INTERIORS OF GLASS CONTAINERS

Herbert C. Snyder, and Urbano J. DeSantis, both of Brockway, Pa., assignors to Brockway Glass Company Inc., Brockway, Pa.

Filed Sept. 2, 1971, Ser. No. 177,380

Int. Cl. C03b *9/00, 9/44*

U.S. Cl. 65—260 **5 Claims**



The takeout mechanism for a glass container forming machine has an operating rod movable axially toward the container to engage the takeout mechanism with the container at the final mold of the forming machine. This rod comprises a treatment gas conduit and is extended to project into the container when the takeout mechanism is in gripping engagement with the container. Valve means are provided for supplying a measured quantity of treatment gas under pressure to the conduit while the same is projected into the container during a takeout operation. The measured quantity is supplied to the conduit by making equal the pressure in an accumulator of gas and a pressure source by way of the valve means, and then allowing the gas to pass from the accumulator to the conduit.

3,787,198

HERBICIDAL COMPOSITIONS CONTAINING VARIOUS BENZYLTHIODIAZOLES AND TRIAZINES

Hiroshi Hagimoto; Toshiharu Arai; Harutoshi Yoshikawa; Mitsuo Watanabe, all of Kyoto, and Yoshiyuki Okada, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

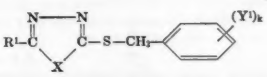
Filed Mar. 31, 1970, Ser. No. 24,386

Claims priority, application Japan, July 1, 1969, 44-51950

Int. Cl. A01n *9/22*

U.S. Cl. 71—93 **4 Claims**

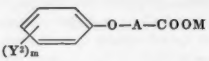
Herbicidal compositions comprise a compound of the formula



(I)

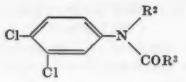
wherein R^1 is hydrogen or alkyl, X is oxygen or sulfur, Y^1 is halogen, lower alkyl, lower alkoxy or nitro, and *k* is zero or an

integer from 1 to 5, or such compound in combination with one or more of salt or ester thereof which is represented by the general formula:



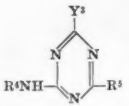
(II)

wherein A is lower alkylene, Y^2 is chlorine or methyl, M is hydrogen, alkali metal, lower alkyl or lower alkenyl, and *m* is zero or an integer from 1 to 5; a 3,4-dichloroanilide which is represented by the general formula:



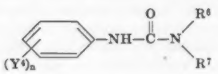
(III)

wherein R^2 and R^3 respectively are hydrogen or lower alkyl; a 1,3,5-triazine compound which is represented by the general formula:



(IV)

wherein Y^3 is chlorine or lower alkylthio, R^4 is lower alkyl, and R^5 is azido or lower alkylamino, or a phenylurea compound which is represented by the general formula:



(V)

wherein Y^4 is halogen or halogen-substituted lower alkyl, R^6 and R^7 respectively are lower alkyl or lower alkoxy, and *n* is zero, 1 or 2.

3,787,199

HERBICIDE BASED ON CYANOALKYLAMINOTRIAZINES

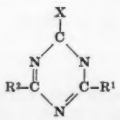
Werner Schwarze, Frankfurt am Main, Germany, assignor to Deutsche Gold-Und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Germany

Division of Ser. No. 804,718, March 5, 1969, Pat. No. 3,629,259. This application Aug. 12, 1971, Ser. No. 171,330. The portion of the term of this patent subsequent to Mar. 24, 1987, has been disclaimed.

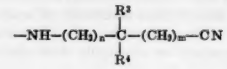
Int. Cl. A01n 9/22

U.S. Cl. 71—93 **26 Claims**

A herbicide in which the active agent is a substituted s-triazine of the formula:



wherein X is halogen, alkoxy or alkylmercapto, alkyl in alkoxy and alkylmercapto having one to six carbon atoms; R^1 is



wherein *n* and *m* are zero or 1 with the provision that only one of n and m may be zero; R^3 and R^4 are the same or different and are straight-chain or branched-chain alkyl having from one to four carbon atoms and wherein either R^3 or R^4 may also be hydrogen; and R^2 is

wherein R^5 is hydrogen or straight-chain or branched-chain lower alkyl.

3,787,200

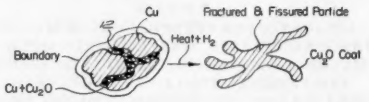
METAL POWDERS FOR ROLL COMPACTING

Walter L. Finlay, New York, N.Y.; Harbhajan S. Nayar, Maynard, and Donald A. Hay, Medfield, both of Mass., assignors to Copper Range Company, New York, N.Y.

Division of Ser. No. 665,332, Sept. 5, 1967, Pat. No. 3,632,697. This application May 25, 1971, Ser. No. 146,789

Int. Cl. B22f 9/00

U.S. Cl. 75—.5 B **3 Claims**



Dispersoid strengthened copper metals characterized by a copper matrix and a refractory dispersoid are produced by roll compacting particles characterized by certain spatial and metallurgical relationships. The spatial considerations are characterized by practicable relationships in copper particles between surface area and overall dimensions. The metallurgical relationships are characterized by critical limits of dimensions and spacing of dispersoid subparticles or components thereof on or in the copper matrix particles either before or after roll compacting.

3,787,201

HIGH TENSILE STRENGTH STEEL PLATE FOR COLD-FORMING

Kameo Matsukura; Tuyoshi Kawano, and Toshio Kikuma, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sept. 16, 1968, Ser. No. 762,340

Claims priority, application Japan, Sept. 18, 1967, 42-59727

Int. Cl. C22c 39/14

U.S. Cl. 75—125 **2 Claims**

A high tensile strength steel of low carbon Si-Cr series for use in frames of automobile which has a tensile strength of 50 to 65 kg/mm² and is particularly excellent in the cold press-formability and fatigue strength, containing Cr and Si in more amounts than conventional high tensile strength steels of this kind and further Cu, Ti, Nb and V besides said elements to obtain above-mentioned characteristics, said steel plate being applicable as hot-rolled.

3,787,202

HIGH TEMPERATURE CHROMIUM-NICKEL ALLOY

Charles P. Mueller, and Gunes M. Ecer, both of Pittsburgh, Pa., assignors to Cyclops Corporation, Pittsburgh, Pa.

Filed Nov. 18, 1970, Ser. No. 90,847
Int. Cl. C22c *19/00, 29/00*
U.S. Cl. 75—134 F 2 Claims

An alloy containing 45 to 55 percent chromium, 45 to 55 percent nickel, 0.003 to 0.4 percent cerium, up to 1.5 percent titanium, up to 1.5 percent zirconium, and up to 1.5 percent hafnium. The titanium, zirconium and hafnium may be present separately in amounts up to 1.5 percent or they may be present in combination in an amount up to 3.0 percent.

3,787,203

WEAR-RESISTANT, CORROSION-RESISTANT COBALT BASE ALLOY

Minoru Yokota, and Morimichi Tanaka, both of Fukuoka, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Nov. 24, 1972, Ser. No. 309,002
Claims priority, application Japan, Nov. 26, 1971, 46-94456
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 3 Claims

This invention relates to a novel cobalt-base alloy having good wear resistance and good corrosion resistance characteristics, which consists of 5.00 – 10.00 percent by weight of Cr, 2.50 – 4.00 percent by weight of B, 0.20 – 2.00 percent by weight of Mn, 0.20 – 2.00 percent by weight of Si, up to 1.00 percent of Fe and up to 2.00 percent by weight of Ni, the balance being Co. When this alloy is used as a lining material for a machine part, such as a steel cylinder or the like, the life of the machine part combined with the alloy can be greatly prolonged.

3,787,204

PRODUCTION OF COMPOSITE MATERIALS CONTAINING COATED INORGANIC FIBERS

Kurt Sachs, Brierley Hill; Frederick Arthur Foreman, Stafford, and John Barlow, Wolverhampton, all of England, assignors to G.K.N. Group Services Limited, Smethwick, Warley, England

Filed July 22, 1971, Ser. No. 165,369
Claims priority, application Great Britain, July 24, 1970, 35932/70
Int. Cl. B22f *1/00*
U.S. Cl. 75—212 13 Claims

A method of making a composite material comprising a metal matrix reinforced with fibres including the steps of producing an intimate mixture of fibre reinforcement and an organic acid salt of a metal, the salt being such that it can be decomposed on heating to form the metal, heating the intimate mixture so that the salt decomposes to give the metal in finely divided form and then applying pressure to the resulting mixture under temperature conditions to form a consolidated matrix reinforced by the fibres.

The organic acid salt may be lead formate.

3,787,205

FORGING METAL POWDERS

Nathan Lewis Church, Warwick, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed May 30, 1972, Ser. No. 257,793
Int. Cl. B22p *3/14*
U.S. Cl. 75—226 9 Claims

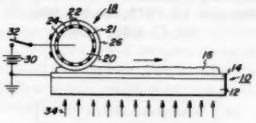
Alloy metal powders are forged over a controlled temperature range such that at the forging temperature the alloy powders are characterized by a microstructure comprised of at least two metallic phases which coact to retard grain growth during recrystallization.

3,787,206

PHOTOELECTRICPHORETIC IMAGING METHOD INCLUDING AT LEAST ONE ELECTRODE CARRYING A PATTERN

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 21, 1971, Ser. No. 191,300
Int. Cl. G03g *13/00*
U.S. Cl. 96—1.2 8 Claims



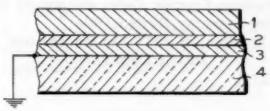
A photoelectrophoretic color imaging system employing an imaging suspension comprising a plurality of colored electrically photosensitive pigment particles in a carrier liquid positioned between two electrodes wherein the imaging suspension is exposed to flood illumination of activating electromagnetic radiation in the presence of an electric field. Imaging is effected by means of imagewise patterns carried by at least one of the electrodes. The color and/or density of the reproduced images are controlled by the color and the intensity of the activating electromagnetic radiation.

3,787,207

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE PLATE HAVING A POLYIMIDE INTERMEDIATE LAYER

Masanaru Hasegawa; Yoshiki Hayashi, both of Hirakata, and Toichi Matsumura, Ikeda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Dec. 16, 1971, Ser. No. 208,708
Int. Cl. G03g *5/00*
U.S. Cl. 96—1.5 4 Claims



This invention provides an improved electrophotographic photosensitive plate with excellent durability and electrophotographic characteristics.

The plate comprises a multilayered electrophotographic photosensitive plate comprising, from the top, a first layer including an organic photoconductive insulating material, a second layer including vitreous selenium, a third layer including a polyimide material and the fourth layer of an electrically conductive backing.

3,787,208

XEROGRAPHIC IMAGING MEMBER HAVING PHOTOCONDUCTIVE MATERIAL IN INTER-LOCKING CONTINUOUS PATHS

Robert N. Jones, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 627,664, April 3, 1967, abandoned. This application Sept. 25, 1970, Ser. No. 75,390
Int. Cl. G03g *5/04*
U.S. Cl. 96—1.8 18 Claims

A xerographic photoreceptor layer which comprises photoconductive particles dispersed in an insulating resin matrix, the photoconductive particles are present in an amount from about 1 to 25 percent by volume of the layer,

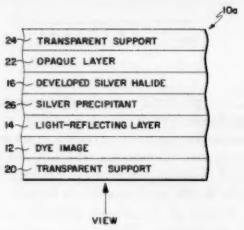
and are dispersed in a controlled manner to form a plurality of continuous paths through the thickness of said layer. Methods of making and imaging the photoreceptor layer are also disclosed.

3,787,209

COLOR DIFFUSION TRANSFER COLOR PROCESS AND FILM WITH SILVER PRECIPITATING LAYER

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1972, Ser. No. 246,671
Int. Cl. G03c *7/00*
U.S. Cl. 96—3 **59 Claims**



Diffusion transfer color processes are disclosed wherein the color image is retained with the developed silver halide emulsion(s) as part of an integral negative-positive reflection print. Provision of a silver precipitating layer between the developed silver halide emulsion layer(s) and a light-reflecting layer substantially reduces discoloration of the color transfer image highlights resulting from undesired transfer of silver ion after formation of the color image.

3,787,210

LASER RECORDING TECHNIQUE USING COMBUSTIBLE BLOW-OFF

Donald Lee Roberts, Cypress, Calif., assignor to The National Cash Register Company, Dayton, Ohio

Filed Sept. 30, 1971, Ser. No. 185,026
Int. Cl. G03c *5/04*
U.S. Cl. 96—27 E **6 Claims**

A recording technique using a laser beam for image recording on a film. In the preferred embodiment, the film comprises a transparent substrate coated with heat absorbing particles, dispersed in a self-oxidizing binder. Contrary to the present practice of directing the laser beam on the coating itself, the laser beam is directed through the substrate with its energy focused on the boundary interface between the substrate and coating. This causes the coating to be removed, as by blow-off or explosion, leaving a clear area on the substrate forming a positive image of the recorded material.

If a negative is desired, the removed material can be collected on a backing, such as Scotch Brand tape, preferably in contact with the coating to thus provide both a positive and a negative of the written information from one and the same operation.

In both instances the laser beam can be scanned or incrementally positioned and a modulating device can gait the laser beam to record machine or human readable characters.

3,787,211

MAKEREADY FOIL FOR RELIEF PRINTING

Otto Volkert, Ludwigshafen; Gerd Schrodt, and Manfred Zuerger, both of Mannheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Germany

Filed Dec. 10, 1971, Ser. No. 206,660
Int. Cl. G03c *1/84, 1/70*
U.S. Cl. 96—35.1 **10 Claims**

The invention relates to a process for the manufacture of a makeready foil for relief printing. A multilayer sheet consisting of a dimensionally stable base which transmits acting light; a non-photopolymerizable intermediate layer which is soluble in solvents and absorbs actinic light; and a photopolymerizable layer which contains a compound capable of absorbing actinic light, is exposed through a negative from the base side and the unexposed portions of the photopolymerizable layer and of the intermediate layer are washed out with a solvent from the photopolymerizable-layer side.

The makeready foil of the invention greatly simplifies the makeready process for the printer.

3,787,212

POLYMERIC PHOTOSENSITIVE COMPOSITIONS AND METHODS USING SAME

Robert A. Heimsch, St. Louis, Mo.; John S. Bartosczewicz, Pennsacola, Fla., and Robert J. Slocombe, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 40,417, May 25, 1970, abandoned. This application Aug. 4, 1972, Ser. No. 277,964
Int. Cl. G03c *1/70*
U.S. Cl. 96—35.1 **37 Claims**

Photosensitive compositions of solid, solvent-soluble acrylonitrile/diene interpolymers with activated aromatic ketone sensitizers, e.g. polynuclear quinones, and applications as photoresists.

3,787,213

PROCESS FOR MODIFYING SURFACES USING PHOTOPOLYMERIZABLE ELEMENTS COMPRISING HYDROPHILIC COLLOIDS AND POLYMERIZABLE MONOMERS

Joseph Edmund Gervay, 283 Spring St., Red Bank, N.J., and Peter Walker, 81 Hialeah Dr., Colts Neck, N.J.

Continuation-in-part of Ser. No. 864,206, Oct. 6, 1969, abandoned, which is a continuation-in-part of Ser. No. 849,297, Aug. 7, 1969, abandoned, which is a continuation-in-part of Ser. No. 766,329, Oct. 9, 1968, abandoned. This application Jan. 19, 1972, Ser. No. 219,165
Int. Cl. G03c *5/00*
U.S. Cl. 96—36 **12 Claims**

A photopolymerizable dispersion coated on a hydrophobic strippable support and comprising a continuous phase with a hydrophilic organic, macromolecular polymer dispersion medium, e.g., gelatin, and a dispersed phase including at least one addition polymerizable ethylenically unsaturated monomer, e.g., an acrylic or methacrylic acid polyester such as pentaerythritol triacrylate, and a photoinitiator is used to make diffusion resist layers suitable for modifying imagewise, surfaces by diffusion etching, plating, dyeing, alteration of sensitivity of radiation-sensitive layers, etc. On exposure to actinic radiation, the dispersed monomer droplets, having a light-activatable initiating system in active association therewith, polymerize or harden to various degrees depending on the amount of actinic radiation received and the layer becomes resistant to diffusion of aqueous, or other normally gelatin diffusible liquids used to make solutions of materials used to modify a surface by diffusion treatment. Exposure may be through any suitable photographic stencil or pattern and this leaves an image in the resist-forming layer. The exposed

resist layer may be pressed against and transferred to a moistened surface, e.g., a metal plate, and the hydrophobic support stripped off. The resist-bearing surface is then modified by diffusion of an aqueous, e.g., aqueous ferric chloride, etching solution to produce a permanently modified surface such as, in the case of using an aqueous ferric chloride etching solution applied to a copper surface, a gravure printing plate. The photopolymerizable dispersion may be coated directly on a surface to be modified and exposed through a suitable transparent photographic image, e.g., a halftone image or a gravure screen and a continuous tone image and etched and the resist removed. The photopolymerizable layer on the hydrophobic support may be laminated to the surface to be modified, and before or after removal of said support, the layer is exposed. The resist bearing surface can then be modified by diffusion etching, plating, e.g., electroplating, dyeing, alteration of the sensitivity of radiation-sensitive layers, etc.

3,787,214

PROCESS FOR UNDERCOATING A SUPPORT OF PHOTOGRAPHIC MATERIAL

Nobuhiko Minagawa, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

Filed Sept. 24, 1971, Ser. No. 183,656

Claims priority, application Japan, Sept. 24, 1970, 45-83649

Int. Cl. G03c *1/80, 1/86*

U.S. Cl. 96—87 R **7 Claims**

A process for undercoating a support of a photographic material is disclosed comprising providing an undercoat layer containing gelatin and a basic substance, such as sodium hydroxide, on an activated surface of a support comprising a polyolefin film or a polyolefin-coated film, said basic substance being included therein so as to maintain the hydrogen ion concentration (pH) of the surface of the undercoat layer at a level of from 6.6 to 9.5. A photographic emulsion adheres firmly to the undercoated surface of the support with a markedly increased bond strength.

3,787,215

PHOTOGRAPHIC MATERIAL WITH BLEACHABLE DYE

Bernhard Piller, Marly-le-Petit, Switzerland

Continuation-in-part of Ser. No. 46,453, June 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 734,205, June 4, 1968, abandoned. This application Jan. 27, 1972, Ser. No. 221,429

Claims priority, application Switzerland, June 7, 1967, 8065/67; Jan. 18, 1968, 757/68

Int. Cl. G03c *1/10*

U.S. Cl. 96—99 **13 Claims**

Photographic, light-sensitive material is provided which contains on a support at least one silver halide layer and at least one layer containing a dyestuff of the formula

wherein A, K, B, M, X and Z each denotes an aromatic residue, the residues A—N=N—B—NH—CO— and K—N=N—M—NH—CO contain groups which confer solubility in water, and Y denotes a water solubility imparting bridging group consisting of at most 4 members.

Above all this photographic material is suitable for the silver dyestuff bleaching process and the dyestuffs are incorporated therein mainly as yellow, magenta or cyan image dyestuffs.

3,787,216

POWDERED FAT COMPOSITION

Winston Harold Wingerd; Russell Damisch, both of Elgin, Ill., and Marshall Bozzi, Valley Stream, L.I., N.Y., assignors to The Borden Company, New York, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,871

Int. Cl. A23g *3/00*

U.S. Cl. 99—139 **17 Claims**

A composition which can be used to prepare a whipped topping by reconstituting it with milk or water after adding sugar, and whipping the mixture, includes, on dry basis, (a) 1–15 percent film-forming substance, (b) 10–60 percent edible fats, (c) 10–60 percent dextrin, (d) 1–12 percent conventional edible emulsifiers, and (e) 0.1–4 percent polyglycerol esters of fatty acids derived from butter. The novel aspect is in the use of the polyglycerol esters which impart excellent whippability and shorter whipping periods.

3,787,217

METHOD FOR CONTROLLING SEA ORGANISMS

Koyata Nitta; Hironari Sugiyama; Kiyoshi Takita, and Hideo Itoh, all of Shimizu, Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

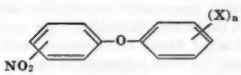
Filed Dec. 17, 1971, Ser. No. 209,337

Claims priority, application Japan, Dec. 25, 1970, 45-123985

Int. Cl. C09d *5/14*

U.S. Cl. 106—15 AF **10 Claims**

The adherence of sea organisms, such as Blue mussel, Balanus, Oysters, Hydrozoa and the like to pipes for supplying sea water and the other articles in sea water can be prevented by using a diphenyl ether having the general formula



wherein X is a halogen, methyl, a lower alkoxy or amino group and *n* is 1 to 3 as an active ingredient. The present invention relates to compositions for combatting sea organisms and a method for combatting sea organisms.

3,787,218

ZIRCON CONTAINING PRINTING PASTE FOR OVERGLAZE COATING OF MICROELECTRONIC CIRCUITS ON CERAMIC SUBSTRATES

Raymond Louis Dietz, Toledo, Ohio, and Allan L. McFadden, Monroe, Conn., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 84,541, Oct. 27, 1970, Pat. No. 3,759,727. This application Aug. 28, 1972, Ser. No. 284,428

Int. Cl. C03c *3/22, 3/12, 3/30*

U.S. Cl. 106—39.5 **10 Claims**

Provided is an overglaze composition particularly useful for protecting a microelectronic circuit from environmental shock and contamination. Such an overglaze comprises by weight about 15–60 percent PbO, 12–40 percent B_2O_3, 5–45 percent ZnO and produces, upon being fired from a printed paste at a firing temperature below about 650°C., a vitreous glass coating which is substantially hermetic in its sealing characteristics. The overglaze composition may optionally accommodate up to 12 percent by weight of other various oxides such as, for example, SiO_2, CuO, V_2O_5, BaO, Bi_2O_3, TiO_2, ZrO_2 and/or may optionally accommodate up to 25 percent by weight of dispersed particulate ceramic materials. In addition, the coating so formed, when fired upon a ceramic substrate having a coefficient of thermal expansion of less than about 100×10^{-7} in./in./°C., exhibits a tenacious bond and a structural stress at the bond interface of between about 2000 psi in

compression to about 1200 psi in tension. Printing pastes are formed from these compositions by admixing the glass produced, in particulate form, with a conventional liquid organic vehicle in amounts sufficient to render the pastes printable.

3,787,219

$CaTiO_3$-CRYSTALLIZABLE GLASS DIELECTRIC COMPOSITIONS

Rajnikant Babubhai Amin, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 22, 1972, Ser. No. 291,174
Int. Cl. C03c *3/22*
U.S. Cl. 106—73.3 **10 Claims**

Powder compositions useful for producing dielectric layers in electronic devices at firing temperatures below 1000°C. The resultant dielectrics exhibit high Q (above 700) and reduced, or even negative, TCC. The compositions comprise 1-40% by weight of calcium titanate and 99-60% of certain lead-free crystallizable glasses and are optionally dispersed in an inert liquid vehicle.

3,787,220

MOLDED ARTICLES AND FILMS

George G. Maher, Dunlap, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 190,319, Oct. 18, 1971, Pat. No. 3,730,829. This application Jan. 24, 1973, Ser. No. 326,220
Int. Cl. D21h *3/28*; **C08b** *25/02*, *27/04*, *27/14*
U.S. Cl. 106—214 **5 Claims**

A method is disclosed for the preparation of a variety of molded articles and films prepared from gels of crosslinked starch xanthate.

A nonexclusive, irrevocable, royalty-free license in the invention herein described, throughout the world for all purposes of the United States Government, with the power to grant sublicenses for such purposes, is hereby granted to the Government of the United States of America.

3,787,221

PELLETS OF PRECIPITATED SILICA

Barry Topcik, Somerville, N.J., assignor to Cities Service Company, New York, N.Y.

Division of Ser. No. 887,403, Dec. 22, 1969, Pat. No. 3,646,183. This application July 9, 1971, Ser. No. 161,944
Int. Cl. C08h *17/02*; **C08j** *1/118*; **C09c** *1/28*
U.S. Cl. 106—288 B **3 Claims**

Precipitated silica pigments are pelletized employing from about 0.25 to about 3.0 percent by weight of a surface active agent as a binding agent. The bulk density of the silica is thereby increased, and by means of these pellets the silica can be incorporated into rubber much faster and with greatly reduced fly-loss.

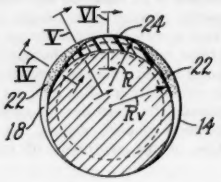
3,787,222

METHOD OF MAKING SELF-LOCKING THREADED ELEMENT WITH LOCKING PATCH EFFECTIVE OVER A WIDE RANGE OF CLEARANCES

Richard J. Duffy, Salem, Mass., assignor to USM Corporation, Flemington, N.J.

Filed Nov. 30, 1971, Ser. No. 203,130
Int. Cl. B44d *1/94*
U.S. Cl. 117—21 **5 Claims**

Method of making a self-locking threaded element, e.g. a screw, including a strongly adhered plastic body or locking patch on its threaded surface where the locking patch is formed with a special configuration for effective locking engagement over a wide range of clearances between the element and mating threaded surfaces, in which method a stream of fine particles of heat softenable resin is directed against a threaded surface portion of a heated metallic element at a temperature lower than that effective to form a continuous convex curved deposit of resin. The threaded portion is kept



in the stream of resin particles for a time sufficient to fill the valleys between threads to an extent of at least one-third in areas of the valleys adjacent the central line of the locking patch and to form thin resin deposits in areas spaced from the central line to give in effect an interupted ridge or bar useful to provide locking action over a wide range of clearances.

3,787,223

CHEMICAL VAPOR DEPOSITION COATINGS ON TITANIUM

Carl D. Reedy, Jr., Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 821,506, May 2, 1969, Pat. No. 3,656,995. This application Aug. 9, 1971, Ser. No. 170,345
Int. Cl. C23c *11/14*
U.S. Cl. 117—69 **3 Claims**

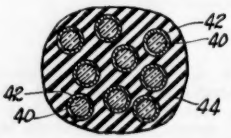
A process for coating titanium-containing substrates with a dense, adherent, chemically vapor deposited coating by initially effecting a pro-tective, adhesion-promoting, intermediate layer on the titanium surface and subsequently depositing from the vapor phase a metal nitride, carbide, or carbonitride coating on the intermediate film. For example, a titanium article may be initially nitrided to provide a titanium nitride protective layer and titanium nitride, titanium carbide, or titanium carbonitride may subsequently be deposited from the vapor phase onto this film to provide a dense, adherent, protective coating on the titanium article. The barrier layer serves to pro-mote adhesion between the titanium substrate and the final overlay and to prevent reaction between the substrate and such a reaction ingredient as titanium tetrachloride, which is a preferred constituent for supplying titanium in the titanium carbide, nitride, or carbonitride final coating.

3,787,224

GLASS FIBER REINFORCED ELASTOMERS

William E. Uffner, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 24, 1972, Ser. No. 230,723
Int. Cl. B32b *17/10*, *25/02*
U.S. Cl. 117—72 **17 Claims**



This invention is addressed to the improvement in the bonding relationship between glass fibers and elastomeric materi-

als, wherein glass fibers are treated with a composition formulated to contain a resorcinol-aldehyde resin, a butadiene-styrene vinyl pyridine terpolymer, an incompatible wax and a dicarboxylated butadiene-styrene resin.

3,787,225

ALUMINUM PLATING PROCESS

Charles B. Roberts, Midland, and Frederick L. Acker, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 10, 1971, Ser. No. 141,957
Int. Cl. C23c *11/00*
U.S. Cl. 117—47 R 10 Claims

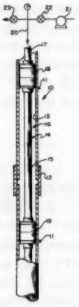
Described is a closed loop method of producing a volatile aluminum hydride trimethylamine complex, depositing aluminum from the complex onto a substrate, and recycling trimethylamine vapor released during deposition to produce additional aluminum hydride trimethylamine complex.

3,787,226

METHOD OF TREATING TUBULAR GOODS WHILE SIMULTANEOUSLY TESTING THE INTERIOR THEREOF

Jesse H. Iglehart, and Hilary H. Iglehart, both of Odessa, Tex., assignors to Spinning Pipe Service, Inc., Odessa, Tex.

Filed Nov. 23, 1971, Ser. No. 201,448
Int. Cl. B44d *1/02*
U.S. Cl. 117—66 7 Claims



A method of treating tubular goods with an inhibitor which comprises forcing the inhibitor into intimate contact with the surface area of the metal goods to be treated by utilizing high pressure techniques. The inhibitor is forced into the multitude of cracks and minute voids located in the irregular surface of the metal, so that after the pressure is removed and the inhibitor drained from the surface, a coating of the inhibitor is left within the outer boundary of the metallic surface, thereby forming a protective film on the surface of the metal.

Advantage is taken of this expedient to provide a method of simultaneously treating pipe surfaces with an inhibiting agent, while at the same time the pipe joints are hydrostatically tested.

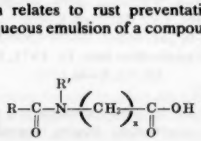
3,787,227

RUST PREVENTATIVE COMPOSITIONS

Nelson S. Marans, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed June 29, 1972, Ser. No. 267,721
Int. Cl. C23f *11/14*; C23d *3/00*
U.S. Cl. 117—75 4 Claims

This invention relates to rust preventative compositions comprising an aqueous emulsion of a compound of the general formula:



wherein R′ is hydrogen or a lower alkyl containing one to six carbon atoms; R is either C_nH_{2n+1}, C_nH_{2n-1} or C_nH_{2n-3}; n is an integer from 11 to 23 and x is an integer from 1 to 4.

3,787,228

METHOD OF FORMING DIFFUSION COATINGS

John J. Rausch, Antioch, and Ray J. Van Thyne, Oak Lawn, both of Ill., assignors to Surfalloy Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 768,187, Oct. 16, 1968, Pat. No. 3,620,816. This application Nov. 12, 1971, Ser. No. 198,403
Int. Cl. C23c *9/00*
U.S. Cl. 117—114 R 13 Claims

A method of diffusing elements into a ferrous substrate using molten lead as the transport medium for the elements being diffused. Such diffusion coatings containing chromium, cobalt, manganese, and other elements that improve corrosion resistance of ferrous materials have considerable utility.

3,787,229

LOW-FRICTION, WEAR-RESISTANT MATERIAL

Robert G. Rudness, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 17, 1971, Ser. No. 116,180
Int. Cl. B65h *57/24*; B23p *3/00*; B32b *27/20*
U.S. Cl. 117—132 BE 10 Claims

A material, and the process therefor, having at least a surface layer of highly densified, uniformly disposed spheres or spheroids partially embedded in a matrix with the exposed segments thereof forming a uniformly wavy finish with low-friction and wear-resistant characteristics.

3,787,230

METHOD OF APPLYING POWDER PAINT

Edward P. Hoffman, St. Louis, Mo., and Robert P. Sikorski, Clawson, Mich., assignors to Grow Chemical Corp., New York, N.Y.

Filed Oct. 6, 1971, Ser. No. 187,137
Int. Cl. B05c *11/10*; B44d *1/06*, *1/08*
U.S. Cl. 117—102 A 7 Claims

Powder paint is applied to an article to be coated by forming a slurry of substantially uniformly suspended non-water soluble powder paint in water, while maintaining the powder in such substantially uniform suspension coating the surface to be painted with said slurry, and thereafter evaporating the water from the slurry coating and curing the powder paint to form a substantially continuous uniform paint film on the article. Where the slurry is applied by spraying, overspray is collected, the powder paint filtered therefrom and re-mixed in the slurry being sprayed.

3,787,231

DENTURES HAVING A DIALKYLPOLYSILOXANE COATING

Constantin Lebel, Paris, and Pierre Pruvost, Lyon, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Oct. 14, 1971, Ser. No. 189,397
Claims priority, application France, Oct. 15, 1970, 70.37259
Int. Cl. A61c *13/24*
U.S. Cl. 117—138.8 A 5 Claims

Dentures are coated with a film, preferably 0.25–5.0μ, of a dialkylpolysiloxane of viscosity 300–100,000 centipoise at 25°C. The coating improves the retention of the denture in the mouth and minimizes food adhesion.

3,787,232

LOW TEMPERATURE CURING POLYMERS USED AS COATINGS FOR FIBROUS MATERIALS

Bela K. Mikofalvy, Sheffield Lake, and Donald P. Knechtges, Middleburg Heights, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Division of Ser. No. 216,819, Jan. 10, 1972, Pat. No. 3,748,295. This application Mar. 19, 1973, Ser. No. 342,745
Int. Cl. D21h 1/40
U.S. Cl. 117—155 UA 7 Claims

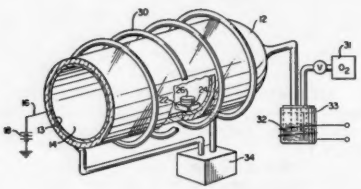
Vinylidene halide polymers capable of being cured at low temperatures are prepared by the emulsion polymerization of one or more vinylidene halide monomers with a carboxylic acid monomer and an N-alkylol amide monomer in an aqueous system. The resulting polymers develop optimum or near optimum physical properties upon curing at room temperature or at temperatures up to about 225°F. These polymers may be used as coatings for fibrous materials.

3,787,233

METHOD OF GROWING MOBILE POSITIVE ION FREE SiO_2 FILMS

Ronald L. Koepp, Dayton, and Stanley J. Dudkowski, Kettering, both of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Division of Ser. No. 866,185, Oct. 14, 1969, Pat. No. 3,645,695. This application Aug. 5, 1971, Ser. No. 169,546
Int. Cl. B44c 1/18; C23c 11/00
U.S. Cl. 117—201 5 Claims



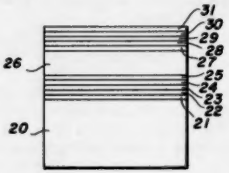
The present invention relates to a process for growing and annealing a silicon dioxide insulator layer to obtain a mobile positive ion free silicon dioxide insulator layer. A mobile positive ion free silicon dioxide insulator layer is required in order to make a stable insulated gate field effect transistor. The processing apparatus comprises a non-oxidizing, high-melting-point platinum metal film coated quartz furnace tube, potential means for placing a positive potential upon the platinum metal film coating of the platinum metal film coated quartz furnace tube to repel mobile ions therefrom, heater means for heating the interior of the quartz furnace tube, and gas means for passing oxygen gas through the platinum metal film coated quartz furnace tube. A silicon wafer may be oxidized in said processing apparatus to form a relatively mobile positive ion free silicon dioxide insulator layer of an insulated gate field effect transistor upon the silicon wafer. The silicon dioxide insulator layer is relatively uncontaminated by mobile positive ions which exist to the outside of the platinum metal film coated quartz furnace tube. A silicon wafer which previously has been coated by a silicon dioxide insulator layer may be processed to remove mobile ions within the silicon dioxide insulator layer. Mobile positive ions are repelled by the positive potential applied to the platinum metal film away from the outside of the quartz furnace tube, and mobile positive ions of the silicon dioxide insulator layer within the platinum metal film coated quartz tube are removed by the flowing oxygen gas due to the low vapor pressure of the mobile positive ions.

3,787,234

METHOD OF PRODUCING A THIN FILM LASER

Vern N. Smiley, San Diego; Adolph L. Lewis, La Mesa, and David K. Forbes, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 18, 1969, Ser. No. 842,916
Int. Cl. B44d 1/14
U.S. Cl. 117—217 14 Claims



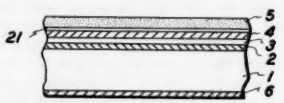
A thin layer of laser material is deposited on an appropriate substrate with a second layer of a suitable activator material such as silver or copper, for example, deposited thereover. The deposition of laser material is accomplished at as high a temperature as possible while maintaining a practicable deposition rate. The combination of layers is then baked at a high temperature in air or an inert atmosphere for several hours and slowly reduced to room temperature. The method transforms the film of laser material into a single crystal or several smaller crystallites capable of desirable laser action. In its preferred embodiment reflective coatings, anti-reflective coatings, and multi-layers may be employed to enhance the laser performance.

3,787,235

METHOD OF ELECTROPHOTOGRAPHIC SENSITIVE PAPER

Satoru Honjo, and Yasuo Tamai, both of Osaka, Japan, assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 52,311, July 6, 1970, Pat. No. 3,720,514. This application Sept. 22, 1972, Ser. No. 291,437
Int. Cl. B44d 1/18; G03g 5/00; B44d 1/10
U.S. Cl. 117—218 2 Claims



Electrophotographic paper is provided which comprises a waterproof paper treated with inorganic colloidal oxide dispersion having an electroconductive layer coated on the treated surface and a photoconductive insulating layer residing on the surface of the electroconductive layer.

3,787,236

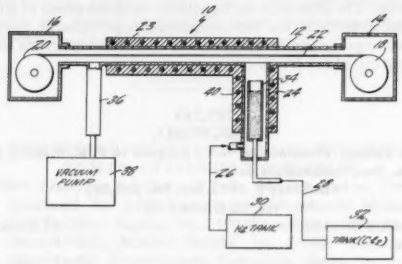
TUNGSTEN COATED GLASS FIBER

Romeo G. Bourdeau, Wapping, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Continuation-in-part of Ser. No. 864,839, Oct. 8, 1969, abandoned. This application Nov. 11, 1971, Ser. No. 197,913
Int. Cl. B44a 1/02
U.S. Cl. 117—227 1 Claim

A composite fiber adapted for usage as a resistively heated substrate in a continuous boron deposition process is

described. The fiber has a glass filamentary core provided with a uniform continuous coating of tungsten, the glass core having a coefficient of thermal expansion of 3.5 to 5.0×10^{-6} in./in./° C so as to match that of the tungsten.



3,787,237

METHOD OF MAKING A THIN FILM HAVING A HIGH COERCIVE FIELD

Georges Grunberg; Igor Melnick, both of Grenoble, and Jean Pierre Lazzari, Seyssinet, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 689,931, Dec. 12, 1967, abandoned. This application June 22, 1971, Ser. No. 155,640

Claims priority, application France, Dec. 23, 1966, 66.88714

Int. Cl. H01f *10/02*

U.S. Cl. 117—239 **10 Claims**

An isotropic thin film having a high coercive field for use as a magnetic memory, and comprising a non-ferromagnetic substrate, at least one chromium layer having a thickness smaller than 10,000 A overlying said substrate and at least one cobalt layer having a thickness smaller than 1,000 A overlying the chromium layer. In a process for the fabrication of the thin film, the chromium layer or layers and the cobalt layer or layers are deposited on the non-ferromagnetic substrate by evaporation under a vacuum.

3,787,238

FLUORESCENT SCREENS

Peter C. Juliano, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 10, 1971, Ser. No. 206,609

Int. Cl. H01j *1/54*; C08g *47/10*; C09k *1/00*

U.S. Cl. 117—335 R **8 Claims**

A fluorescent screen for use as an image intensifying screen is provided having a support, a light reflecting layer, a layer of fluorescent particles and an outer protective coating. The protective coating is a polymeric material having incorporated therein an effective amount of a transparent binary polydimethylsiloxane-polyalkylmethacrylate block copolymer.

ERRATUM

For Class 127—1 see:
Patent No. 3,787,241

3,787,239

CHEMICAL STRIPPERS AND METHOD OF USING

Kenneth H. Schroeder, Wilmington, Del., and George J. Kelly, Jr., Port Murray, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 75,660, Sept. 25, 1970, Pat. No. 3,676,219, which is a continuation-in-part of Ser. No. 866,036, Oct. 13, 1969, abandoned. This application July 10, 1972, Ser. No. 270,125. The portion of the term of this patent subsequent to July 11, 1989, has been disclaimed.

Int. Cl. C23g *1/02*

U.S. Cl. 134—2 **9 Claims**

Strippers for removal of organic films and deposits, such as the polymeric etch resists employed in the manufacture of semiconductors from inorganic surfaces commonly encountered in the electrical and electronic industries, are composed of solutions of chromium trioxide in mixtures of strong nitric and sulfuric acids containing about 2 percent to about 20 percent water.

3,787,240

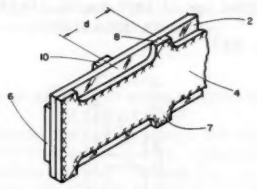
COMPOSITION SEPARATOR WITH MEMBRANCE EXTENSION

Leland M. Gillman, Denver, and Robert E. Stark, Littleton, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed July 2, 1971, Ser. No. 159,125

Int. Cl. H01m *3/04*

U.S. Cl. 136—30 **19 Claims**



A composite multi-layer separator for use in alkaline electrochemical cells is disclosed including at least two bibulous layers sandwiching at least one semi-permeable membrane. The membrane layer marginally extends beyond at least one of the adjacent bibulous layers at each point along the margin of the composite separator. Mechanical strength and ease of handling are supplied to the separator membrane by providing marginally extending supporting means along the edges of the bibulous layer(s). The separator layers may also be laminated together for further mechanical integrity.

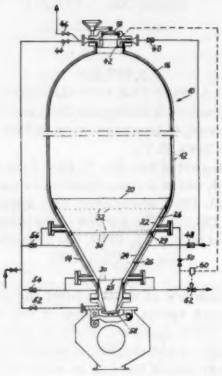
These separators find use in a variety of alkaline galvanic cells, particularly in rechargeable cells such as nickel-cadmium, nickel-zinc, silver-zinc, manganese dioxide-zinc, and similar cells.

3,787,241

APPARATUS FOR PROCESSING DEGRADATION OF CELLULOSIC MATERIALS

Rudolf Eickemeyer, Torwangerstr. 10, Munich, Germany

Division of Ser. No. 767,669, Oct. 15, 1968, Pat. No. 3,640,768. This application July 19, 1971, Ser. No. 163,728
Claims priority, application Germany, Oct. 17, 1967, P 15 67 335.5
Int. Cl. C13k 1/02
U.S. Cl. 127—1 14 Claims



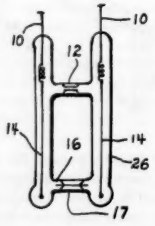
An apparatus, for decomposing cellulosic materials, in the form of a percolator vessel, has a conical filter disposed with apertures which is mounted on the lower portion of the vessel. A system of liquid and steam valves controlling the inlets and outlets to the percolator vessel is used to treat cellulosic material in a series of steps with resulting decomposition of almost the entire load of material initially placed into the percolator.

3,787,242

ELECTROCHEMICAL CELL WITH ALUMINUM ELECTRODES AND DIFFERENT ELECTROLYTE CONCENTRATION IN TWO COMPARTMENTS

David W. Seegmiller, QTRS 4200A, USAF Academy, and Lowell A. King, QTRS 4182, USAF Academy, both of Colo.

Filed Apr. 15, 1971, Ser. No. 134,281
Int. Cl. H01m 11/00
U.S. Cl. 136—83 T 1 Claim



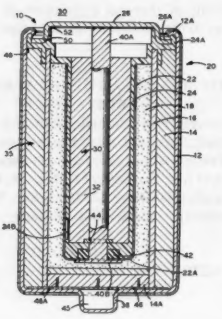
An improved electrochemical cell of the thermal type is described. The improved cell comprises two interconnected compartments with separate aluminum electrodes and separate solid electrolytes positioned in each compartment. The solid electrolytic material positioned within each compartment consist essentially of a mixture of aluminum chloride and sodium chloride having proportions such that the gross stoichiometric composition of the electrolyte in one compartment is less than 50 mole percent aluminum chloride while the gross stoichiometric composition of the electrolyte in the other compartment is greater than 50 mole percent aluminum chloride. The difference in the relative concentrations of aluminum chloride in the two compartments provides an unexpected improvement in the operating characteristics of the improved cell of this invention.

3,787,243

ENERGY CELL

John Zaleski, Pleasantville, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed May 8, 1972, Ser. No. 255,881
Int. Cl. H01m 1/06
U.S. Cl. 136—107 17 Claims



An electric cell having a hermetic pressure seal, and subject to development of high internal gas pressure in the normal operating region, and provided with an auxiliary venting region at atmospheric pressure separated from the operating region with a frangible disc in a separating wall between operating and venting regions with cotton flock in the venting region to retard any high pressure gas and electrolyte injected after fracture of the disc by high pressure in operating region.

3,787,244

METHOD OF CATALYZING POROUS ELECTRODES BY REPLACEMENT PLATING

Lee F. Schulmeister, Wallingford, and Richard C. Nickols, Jr., South Windsor, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 2, 1970, Ser. No. 8,035
Int. Cl. H01m 13/04
U.S. Cl. 136—120 FC 3 Claims

A porous or sintered fuel cell electrode which is catalyzed by means of a replacement plating process. An acidic plating solution containing a salt of a noble metal catalyst is forced through the pores of a nickel electrode substrate and the noble metal ions from the dissolved salt replace a thin layer of the nickel surface within the pores.

3,787,245

METHOD FOR THE BORATION OF TITANIUM AND TITANIUM ALLOYS

Helmut Eduard Kunst, Osterholz-Scharmbeck, Germany, assignor to Institut Fur Harterei-Technik, Bremen-Lesum, Germany

Filed Oct. 26, 1970, Ser. No. 84,229
Int. Cl. C23f 7/00
U.S. Cl. 148—6 5 Claims

Metals, especially titanium and titanium alloys, are borated with a borating agent prepared by annealing amorphous boron

at a temperature between 850°C and 1,300°C in an inert gas, especially a noble gas. The boration is best accomplished by packing the metal into the borating agent and heating it to a temperature between 900°C and 1,400°C while passing a noble gas through the borating agent. Activators and inert substances can be added to the borating agents.

3,787,246

PROCESS FOR PRODUCING A PROTECTIVE COLOR FILM ON AN ALUMINUM SUBSTRATE

Hideo Tagai, No. 4-1 Den-en Chofu, Ohta-ku, Tokyo; Toshiro Takahashi, No. 2-100 Magarigane, Shizuoka-shi, Shizuoka-ken; Toshihiro Nagano, No. 2-100 Magarigane, Shizuoka-shi, Shizuoka-ken; Matsuo Suzuki, No. 2-100 Magarigane, Shizuoka-shi, Shizuoka-ken; Katsushige Ikeda, No. 2-389 Nishi Awaji-cho, Higashi Yodogawa, Osaka-shi, Osaka-fu; Takashi Kato, No. 2-389 Nishi Awaji-cho, Higashi Yodogawa, Osaka-shi, Osaka-fu, and Nobuo Minagawa, No. 2-389 Nishi Awaji-cho, Higashi Yodogawa, Osaka-shi; Osaka-fu, all of Japan

Filed July 6, 1971, Ser. No. 160,110

Claims priority application Japan, July 7, 1970, 45-59267

Int. Cl. C23f *7/06*

U.S. Cl. 148—6.27 **4 Claims**

A process is disclosed for producing a firmly adhered colored film on an aluminum substrate without anodization. The process is carried out at certain temperatures and in the presence of specified quantities of organic amines which amines act to cause a coating to adhere intimately to the aluminum surface and impart a clear amber color to the coating.

3,787,247

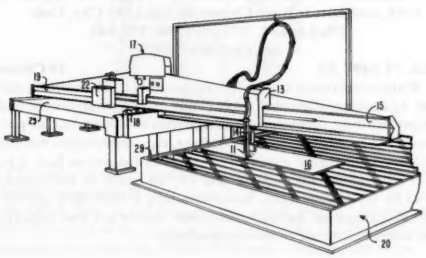
WATER-SCRUBBER CUTTING TABLE

Richard W. Couch, Jr., Hanover, N.H., assignor to Hypertherm Incorporated, Hanover, N.H.

Filed Apr. 6, 1972, Ser. No. 241,783

Int. Cl. B23k *7/10*

U.S. Cl. 148—9 R **9 Claims**



The cutting table disclosed herein is particularly adapted for use in conjunction with a plasma arc cutting torch in a system in which the torch is traversed in a pattern over a metal plate workpiece to perform a desired cutting operation. The cutting table supports the workpiece at a multiplicity of points and includes means for containing a body of water with a surface in contact or at least close proximity with the bottom of the plate. Accordingly, as the high velocity gases performing the cutting impinge upon the body of water, they are forcefully intermixed therewith. Accordingly, the particulate pollutants entrained in the gas jet are effectively scrubbed out, rather than being carried into the atmosphere.

3,787,248

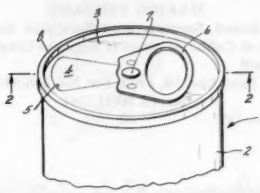
PROCESS FOR PREPARING ALUMINUM ALLOYS

William C. Setzer, Hamden; Harvey P. Cheskis, Woodbridge, and Joseph Winter, New Haven, all of Conn.

Filed Sept. 25, 1972, Ser. No. 291,835

Int. Cl. C22f *1/04*

U.S. Cl. 148—11.5 A **12 Claims**



The present invention teaches a process for preparing high strength, improved formability aluminum base alloys suitable for use as can end stock, said high strength aluminum material of the present invention being readily compatible with aluminum can body material. The present invention also teaches an improved aluminum can having ends and body of substantially the same aluminum base alloy, which can as a whole is especially convenient to process in scrap reclamation procedures.

3,787,249

ALUMINUM ALLOY

Andrew J. Brock, Cheshire, and Michael J. Pryor, Woodbridge, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 148,582, June 1, 1971, Pat. No. 3,720,508. This application Oct. 24, 1972, Ser. No. 299,917

Int. Cl. C22f *1/04*

U.S. Cl. 148—11.5 A **5 Claims**

This disclosure teaches a novel aluminum alloy having high resistance to oxidation during hot rolling, improved surface appearance and improved bright anodizing characteristics and the method of processing same. The alloy contains from 0.5 to 3 percent magnesium, from 0.02 to 0.5 percent silver, from 0.001 to 0.2 percent iron, from 0.001 to 0.15 percent silicon, balance essentially aluminum, wherein the silver is substantially dissolved in solid solution in the matrix.

3,787,250

CORROSION-RESISTANT HIGH-STRENGTH LOW-ALLOY STEELS

Michael Korchynsky, Bethel Park; John R Bell, and Richard J. Cover, both of Pittsburgh, all of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 123,470, March 11, 1971, Pat. No. 3,711,340. This application Oct. 5, 1972, Ser. No. 296,721

Int. Cl. C21d *7/14*

U.S. Cl. 148—12 **4 Claims**

Low-alloy steels having five to eight times the atmospheric corrosion resistance of carbon steels, 80,000 psi minimum yield strengths and an overall desirable balance of mechanical properties produced directly off the hot-mill have the following chemistry: carbon, .04 percent to .10 percent; manganese, .40 percent to 1.80 percent; sulfur, .03 percent maximum; aluminum, .015 percent minimum; chromium, .90 percent to 1.20 percent copper, .30 percent to .50 percent; silicon, .50 percent to 1.20 percent; phophorus, .10 percent to .15 percent; columbium, .015 percent to .040 percent; and zirconium, .04 percent to .12 percent or a total content of rare earth elements, such as cerium and lanthanum, such that the weight

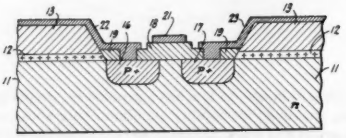
ratio of total rare earths to sulfur is at least 2.8 to 1. In processing the steel to strip or plate, it is hot-rolled so as to have a finishing temperature between its A_3 temperature and 1,700° F, cooled at a rate between 20° F/sec. and 45° F/sec. and coiled or piled at a temperature of 1,100° F ± 100° F.

3,787,251

MOS SEMICONDUCTOR STRUCTURE WITH INCREASED FIELD THRESHOLD AND METHOD FOR MAKING THE SAME

Warren L. Brand, Saratoga, and Farajollah Kashkooli, San Jose, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Apr. 24, 1972, Ser. No. 246,918
Int. Cl. H01l 7/44
U.S. Cl. 148—187 **4 Claims**



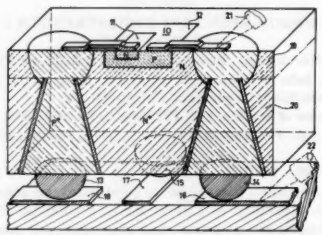
An MOS semiconductor structure and method for making the same in which a semiconductor wafer is treated to form an thin oxide layer having a net charge. In a specific embodiment a positive net charge is introduced into the oxide layer through introduction of chrome ions. Field oxide is then grown over the thin oxide layer. The field oxide and thin oxide layers are removed from selective portions of the semiconductor wafer. Source and drain diffusions are made into the semiconductor wafer and a gate oxide along with gate source and drain electrodes are formed. The introduction of the positive oxide charge over the field region increases the field voltage threshold and permits use of a thinner field oxide.

3,787,252

CONNECTION MEANS FOR SEMICONDUCTOR COMPONENTS AND INTEGRATED CIRCUITS

Franco Filippazzi, Milano, and Franco Forlani, Rho, both of Italy, assignors to Honeywell Information Systems Italia S.p.A., Milan, Italy

Continuation of Ser. No. 838,221, July 1, 1969, abandoned.
This application Nov. 8, 1971, Ser. No. 196,380
Claims priority, application Italy, July 5, 1968, 18595A/68
Int. Cl. H01l 19/00, 7/36, 5/00
U.S. Cl. 148—175 **3 Claims**



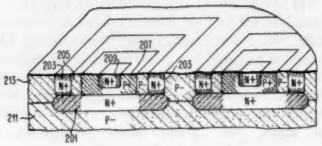
In a semiconductor wafer having an epitaxial layer on which circuit elements are formed, through-connections for said circuit elements to contacts formed on the opposite surface of the layer are provided by tapered high conductivity semiconductor regions insulated from the body by a thin layer of dielectric material and in contact with suitably doped portions of the epitaxial layer to provide insulation by means of reversely biased junctions.

3,787,253

EMITTER DIFFUSION ISOLATED SEMICONDUCTOR STRUCTURE

Kanu Ashar, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1971, Ser. No. 209,237
Int. Cl. H01l 7/36, 19/00
U.S. Cl. 148—175 **2 Claims**



An improved self-isolated semiconductor integrated circuit structure is formed by a novel process beginning with diffusing a plurality of N-type buried layers onto a P-type substrate and epitaxially growing a thin P-type layer over the surface of the P-type substrate. Base regions are formed by diffusing a plurality of P-type regions into the P-type epitaxial layer. Collector contact regions and emitter regions are formed by simultaneously diffusing a plurality of N-type regions into the P-type epitaxial layer, the collector contact regions being spaced from the P-type base region and diffused through the epitaxial layer to contact the N-type buried layer, and the emitter regions being diffused within the P-type base regions. A semiconductor integrated circuit structure results having base regions with controllable wide range concentration levels, formed with only three selective diffusion process steps.

3,787,254

EXPLOSIVE COMPOSITIONS CONTAINING CALCIUM NITRATE

Melvin A. Cook; Lex L. Udy, both of Salt Lake City; Mark J. Hagmann, Midvale, and Harvey A. Jessop, Murray, all of Utah, assignors to Ireco Chemicals, Salt Lake City, Utah

Filed June 1, 1971, Ser. No. 148,941
Int. Cl. C06b 1/04
U.S. Cl. 149—60 **19 Claims**

Water-containing explosive compositions, substantially stable against gravitational segregation of the ingredients and degasification, comprise a homogenous emulsion-like dispersion of (1) inorganic nitrate oxidizer, e.g., ammonium nitrate, (2) finely dispersed particles of liquid hydrocarbon fuel, e.g., fuel oil, (3) calcium nitrate and (4) an agent to sufficiently thicken said composition to substantially inhibit such gravitational segregation during formulation and/or use and improve the water resistance of the composition.

3,787,255

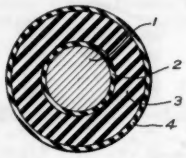
INSULATED CABLE WITH SHEATH OF CONTROLLED PEEL STRENGTH AND METHOD

Francis F. Carini, Pittsburgh, Pa., and Steven R. Abbott, Vincennes, Ind., assignors to Essex International, Fort Wayne, Ind.

Filed May 30, 1972, Ser. No. 258,077
Int. Cl. H01b 13/14
U.S. Cl. 156—51 **5 Claims**

A high voltage electrical cable having at least two layers of

cross-linked polyolefin insulation, i.e. polyethylene; the external layer being semi-conductive and strippable from the inter-



nal layer. Controlled strippability is accomplished by sulfonating the respective layers at their contact interface.

3,787,256

NONWOVEN SHEET STRUCTURES FROM MODIFIED POLYOLEFIN FIBERS

Kurt A. Nowotny, Camas, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Sept. 13, 1971, Ser. No. 180,212

Int. Cl. D21j *3/00*

U.S. Cl. 156—62.2 **8 Claims**

A sheet structure prepared from modified polyolefin fibers and a method of preparation of the structure. The fibers are modified by introducing thereinto halide groups and acid groups with disassociatable hydrogen ions, and from this a stabilized water dispersion is prepared. A mat is prepared from the dispersion of fibers.

3,787,257

METHOD TO SEAL TWO MATERIALS TO EACH OTHER AND A DEVICE TO CARRY OUT THE METHOD

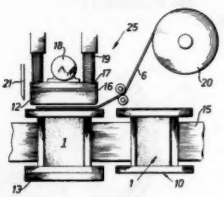
Jan Akerlund, Malmo, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Filed Nov. 30, 1971, Ser. No. 203,151

Claims priority, application Sweden, Dec. 7, 1970, 16509/70

Int. Cl. B32b *31/16, 31/00*

U.S. Cl. 156—73 **15 Claims**



Two sheets of packaging material at least one of which has a plastic surface on at least one side are sealed together by moving them past a vibrating heater block which vibrates in a plane normal to the plane of the sheets. The sheets are located between the vibrating heater block and a support for these.

3,787,258

METHOD AND APPARATUS FOR DEPICTING LETTERS, PATTERNS AND THE LIKE ON SUBSTRATES

Tadao Takahashi, and Shoji Kitabayashi, both of Tokyo, Japan, assignors to Iwatsu Electric Company Limited, Tokyo, Japan

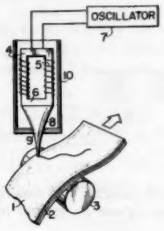
Filed Sept. 18, 1969, Ser. No. 859,052

Claims priority, application Japan, Sept. 24, 1968, 43-68233

Int. Cl. B32b *31/16*

U.S. Cl. 156—73 **4 Claims**

Apparatus for depicting letters or patterns on the surface of a substrate with a metal foil comprises a vibrator energized by a current of supersonic frequency, and a pointed amplitude magnifying horn secured to the vibrator. To depict letters or patterns, a metal foil is placed on either side of the substrate, the horn is urged under slight pressure against the surface of



the metal foil or substrate and the vibrator is moved by hand in the X and Y directions to depict letters or patterns whereby portions of the metal foil are separated and are firmly adhered to the surface of the substrate.

3,787,259

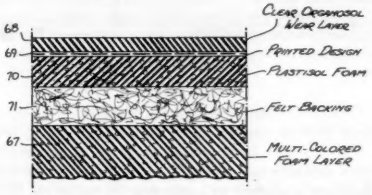
VINYL CHLORIDE RESIN BACKED FLOOR COVERING

Martin J. Kleinfeld, Woodbridge, and Alfred J. Heinrichs, Hamden, both of Conn., assignors to Uniroyal Inc., New York, N.Y.

Continuation-in-part of Ser. No. 73,452, Sept. 18, 1970, abandoned. This application Nov. 10, 1971, Ser. No. 197,303

Int. Cl. B32b *5/20, 31/26*

U.S. Cl. 156—78 **6 Claims**



Floor covering is backed by applying to the back of the floor covering dry, solid fragments of prefluxed plasticized vinyl chloride resin compound, in the form of granules or dice, for example. Heat is applied to melt the prefluxed vinyl granules or the like in situ on the back of the floor covering to form a continuous backing sheet which is firmly adhered to the floor covering. The backing thus formed can serve to lock the tufts in place in a tufted carpet. The prefluxed granules or fragments can contain a chemical blowing agent which decomposes during the heating, producing a resilient vinyl foam backing. Since the vinyl granules can be of various colors, a tweed or multi-colored backing can be produced.

3,787,260

PROCESS FOR MAKING COMPOUND TEXTILE MATERIALS

Helmar Passler; Adolf Heger, and Sabine Fronius, all of Dresden, Germany, assignors to VEB Textilkombinat Cottbus, Cottbus, Germany

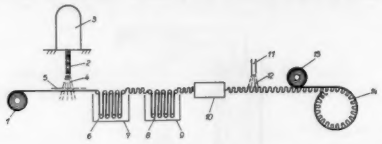
Filed Jan. 27, 1972, Ser. No. 221,253

Int. Cl. D06m *11/00*

U.S. Cl. 156—84 **17 Claims**

Compound textiles, particularly compound sheet materials as used in the garment and interior decorating arts, are made

by causing free radicals to form in selected areas of a polymeric textile sheet; then contacting the sheet with a shrinking agent which preferentially affects the said selected areas by



reaction with said free radicals; and finally uniting the selectively shrunken sheet on one or both of its major faces with another fabric.

3,787,261

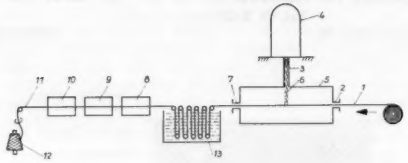
PROCESS FOR TEXTURIZING FIBERS OBTAINED BY SPLITTING SYNTHETIC FOILS AND PRODUCTS MADE THEREFROM

Adolf Heger; Helmar Passler, and Ellen Patitz, all of Dresden, Germany, assignors to VEB Textilkombinat Cottbus, Cottbus, Germany

Filed Jan. 27, 1972, Ser. No. 221,362

Int. Cl. D02g *1/00*

U.S. Cl. 156—84 **14 Claims**



Fibers obtained by splitting synthetic foils and the resulting products are texturized by subjecting the foil or the fibers obtained after splitting and prior to their separation to a cross-sectionally differential modifying action, and thereafter contacting the modified foil or fibers with a shrinking agent, or subjecting the foil or fibers to stretching.

3,787,262

TIRE BUILDING DRUM

Paul E. Appleby, Cuyahoga Falls; Max D. Brinkley, North Canton, and Robert I. Griffiths, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 24, 1971, Ser. No. 183,484

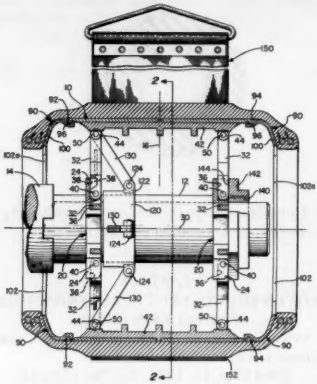
Int. Cl. B29h *17/16*

U.S. Cl. 156—123 **18 Claims**

Method and apparatus for removing a tire too large for unassisted manual handling from a collapsible building drum. The drum comprises both articulated and individually removable segments and is collapsed after removal of certain segments by supporting the tire externally as by a crane sling, and moving the tire axially, axial movement of the tire being sufficient alone to cause the articulated segments to be collapsed permitting continued movement of the tire completely off the drum.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this applciation, reference must be made to the accompanying drawings and the following detailed description.

The invention relates to building massive tires such as for earthmoving vehicles, and particularly to a method of and ap-



paratus for removing such tires in the uncured state from a high-crowned drum on which the same are built.

3,787,263

METHOD OF AND APPARATUS FOR STICKING AN APEX RUBBER STRIP ON BEAD RINGS FOR USE IN PNEUMATIC TIRES

Hisashi Yonekawa; Minoru Miyaoka, and Norio Abe, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 15, 1971, Ser. No. 208,237

Claims priority, application Japan, Dec. 19, 1970, 45-113587

Int. Cl. B29h *17/34*

U.S. Cl. 156—136 **2 Claims**

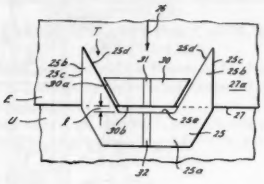
A method of and apparatus for automatically sticking an apex rubber strip on bead rings for use in pneumatic tires on mass production basis are provided whereby a number of bead rings may be fed to and disposed on a pair of driving rollers one by one and a continuous apex rubber strip may be fed to the outer periphery of each bead ring. Successive steps of sticking the forward end of the apex rubber strip on the outer periphery of each bead ring, rotating the driving rollers, detecting the arrival of the forward end of the apex rubber strip stuck on the outer periphery of each bead ring at its final position around the bead ring, obliquely cutting the rear end of one turn of the apex rubber strip, re-starting the rotation of the driving rollers and sticking the rear end of the apex rubber strip thus cut on the bead ring, and replacing the bead ring with a new bead ring, are performed automatically.

3,787,264

WEB SPLICING METHOD AND APPARATUS

Jereld L. Underwood, Houston, Tex., assignor to Houston Chronical Publishing Company, Houston, Tex.

Filed May 25, 1972, Ser. No. 256,988
Int. Cl. B65h 19/00
U.S. Cl. 156—157 10 Claims



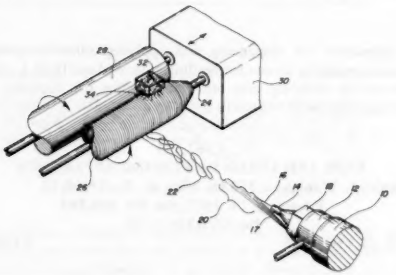
Apparatus for splicing the leading end of a rotating replacement roll to the moving web of an expiring supply roll of sheet material including a main tab member adhesively attached to the underlying layer of said replacement roll and having spaced portions adhesively attached to the leading end; and, a reinforcing tab adhesively attached to the leading end substantially between the spaced portions whereby, upon the application of adhesive and upon the adhesive engagement of the leading end with the moving web, the leading end is torn away from attachment with the main tab member.

3,787,265

PROCESS AND APPARATUS FOR PRODUCING FIBROUS STRUCTURES

Paul H. McGinnis, Kings Mountain; William D. McLaughlin, Jr., and Robert E. Swander, both of Charlotte, all of N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 24, 1972, Ser. No. 237,832
Int. Cl. D04h 3/16
U.S. Cl. 156—167 6 Claims



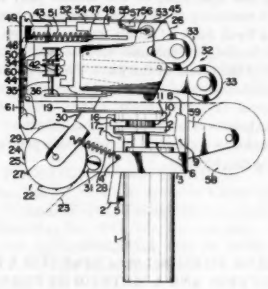
Apparatus and method for producing filamentary material by extruding substantially axially through an orifice comprising contacting the extruded filament stream downstream of the orifice and prior to hardening with a plurality of converging, substantially planar, high velocity gas streams, each moving substantially in the direction of the filament stream such that they converge upon the filament stream at an angle of from about 45° to 5° from the axis of the polymer extrusion nozzle. The planes of the gas streams intersect at a point which is at a distance measured perpendicularly from the axis of the extrudate stream at least equal to the diameter of the extrudate stream.

3,787,266

LABELLER WITH PUSHING-OUT MEANS

Tokio Wada, Tokyo, Japan, assignor to Ceiko Ceiki Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1971, Ser. No. 169,214
Claims priority, application Japan, Aug. 14, 1970, 45-70955; Nov. 6, 1970, 45-97193; Dec. 29, 1970, 45-132946
Int. Cl. B65h 25/00; B65c 9/08
U.S. Cl. 156—361 4 Claims



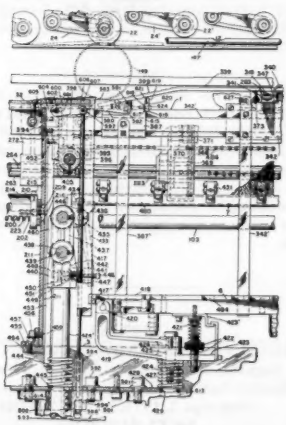
A labeller comprising a casing which is provided with a tape support supporting a tape carrying labels, means for detaching each label by the reverse turning of the tape, a tape feed means, a window supporting the detached label, and a holding portion; a label pushing-out means having a pushing-out portion corresponding to said opening and having at least one pushing-out spring; and a movable member engaging and disengaging said tape feed means and said pushing-out means, said movable member being adapted to engage said pushing-out means to move together therewith and to disengage said pushing-out member at a predetermined position of said pushing-out member while said spring is in a tensioned condition.

3,787,267

LABELLING MACHINE

Clifford H. Neer, Baltimore, Md., assignor to Burt Machine Company, Incorporated, Baltimore, Md.

Division of Ser. No. 605,279, Dec. 28, 1966, Pat. No. 3,648,823. This application Dec. 24, 1969, Ser. No. 888,092
Int. Cl. B65c 9/42, 9/12
U.S. Cl. 156—363 5 Claims



A labeling machine having primary and secondary label feed assemblies provided in the present labeler with a com-

mon source of intermittent power for feeding labels that can be selected to actuate either assembly from a reciprocating power driven member through over-running clutches to give a positive label feeding movement without and to prevent backlash to the label pack supporting and feeding elements. The assemblies may operate independently of each other or/and in an interdependent manner to maintain the top or operating label pickup level of the label pack at a substantially constant operating level. With the present label feed mechanism the operating of the labeler may be continuous without the necessity to stop the labeling operation when introducing a fresh pack of labels to the machine. The primary label pack feeding mechanism stops automatically upon the exhaustion of the labels of the pack. The secondary label pack feeding mechanism also stops automatically upon reaching a predetermined feeding height rather than to a point of complete exhaustion of its respective labels or label pack to prevent breakdown clashing between the primary and secondard feeding mechanisms.

3,787,268

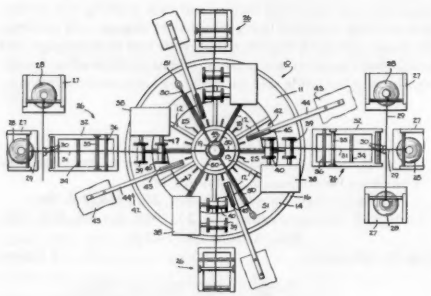
HANK FORMING MACHINE FOR A POLE CONSTRUCTION AND A METHOD OF FORMING A POLE

Arthur Leslie Scott, Columbia; J. Hilton Parsons, Jr., and John S. Hammond, Newberry, all of S.C., assignors to Shakespeare Company, Columbia, S.C.

Filed Nov. 22, 1971, Ser. No. 200,874

Int. Cl. B65h *54/56*

U.S. Cl. 156—425 **25 Claims**



The roving is fed between the spokes of the rotatable member of the hank forming machine to form a plurality of drapes of variable lengths. The drapes are thereafter lifted and pressed against the mandrel for subsequent movement through the deformable orifice. After wrapping with cellophane, the assembly is cured so as to form a self-supporting pole. The length of the drapes between the spokes can be varied so as to form a tapered pole or a pole of variable thickness.

3,787,269

APPARATUS FOR MAKING A FLEXIBLE CLOSURE

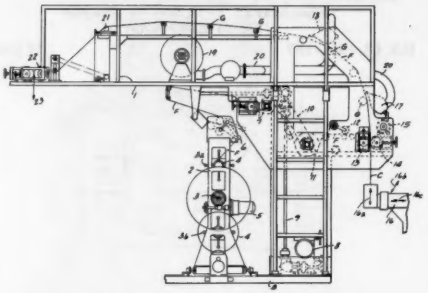
Tanashi Noguchi, Seisan Nippon Sha Ltd. New Kohjimachi Bldg. No. 3 5-chome, Tokyo, Japan

Filed Sept. 7, 1971, Ser. No. 178,086

Int. Cl. B32b *31/30*

U.S. Cl. 156—498 **14 Claims**

A mechanism and method for attaching strips such as those having an interlocking profile thereon to a laminated sheet of plastic wherein the sheet is preheated by passing it over a heated roller and then passed over a heated joining roll having



a nip formed with a pressure roll and feeding a freshly extruded hot strip into the nip and onto the sheet and thereafter applying localized cooling after the strip.

3,787,270

SPLICING TAPE DISPENSER

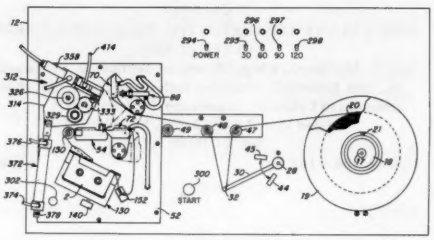
James L. King, Sudbury, Mass., assignor to King Instruments Corp., Waltham, Mass.

Division of Ser. No. 9,552, Feb. 9, 1970, Pat. No. 3,637,153.

This application Apr. 28, 1971, Ser. No. 138,033

Int. Cl. B31f *5/06*; **B65h** *19/28*

U.S. Cl. 156—506 **16 Claims**



Apparatus for dispensing and applying adhesive splicing tape comprising means for feeding splicing tape from a spool, means for severing said tape, and means for applying the severed tape to two tapes to be spliced.

3,787,271

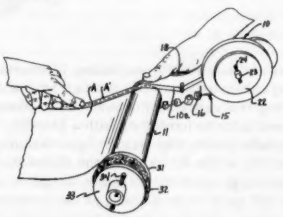
TAPE AND APRON DISPENSING APPARATUS

Stanley L. Wahlquist, 3203 S. Main St., Rockford, Ill.

Filed Aug. 14, 1972, Ser. No. 280,562

Int. Cl. B32b *31/08*

U.S. Cl. 156—554 **8 Claims**



A tape and apron dispensing apparatus in which the apron roll and tape roll are mounted for rotation about spaced, rela-

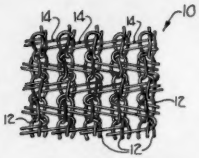
tively parallel axes at one side of an elongated body member and the portion of the body member intermediate the tape and apron rolls is shaped to provide a handgrip paralleling the path of withdrawal of the taped apron and adapted to be grasped in one hand to enable hand manipulation of the tape and apron dispensing apparatus when applying the taped apron to a surface to be masked.

3,787,272

GLASS FABRIC SUITABLE FOR CASTS, BANDAGES, AND THE LIKE

John L. Nisbet, and Hubert C. Woodall, Jr., both of Winston-Salem, N.C., assignors to Carolina Narrow Fabric Company, Winston-Salem, N.C.

Division of Ser. No. 888,447, Dec. 29, 1969, Pat. No. 3,686,725. This application Aug. 23, 1972, Ser. No. 282,927
Int. Cl. A61l *15/00*
U.S. Cl. 161—89 **9 Claims**



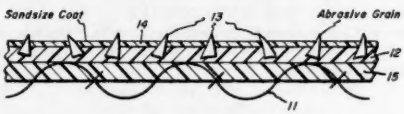
A relatively open air permeable glass fiber fabric for use in orthopedic casts, bandages and the like and comprising interlaced chemically desized glass yarns consisting essentially of filaments having an average diameter not greater than about 0.00021 inches.

3,787,273

LOW STRETCH SECTIONAL ABRASIVE BELTS

John Okrepkie, Troy, N.Y., and Henry J. Swiatek, Mentor, Ohio, assignors to Norton Company, Troy, N.Y.

Filed June 7, 1971, Ser. No. 150,306
Int. Cl. B24d *11/00*
U.S. Cl. 161—87 **6 Claims**



A relatively heavy woven fabric is provided of such construction and finish that, when used as a backing member for coated abrasive material, a sectional abrasive belt can be manufactured of desirably low stretch characteristics.

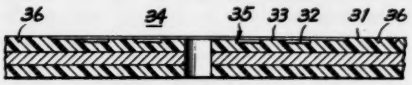
3,787,274

PHONOGRAPH RECORD DISC

Susumu Genma, Tokyo, Japan, assignor to Victor Company of Japan, Yokohama-city, Kanagawa-ken, Japan

Filed May 21, 1971, Ser. No. 145,688
Claims priority, application Japan, May 25, 1970, 45/44660; May 25, 1970, 45/44659
Int. Cl. B32b *3/00*
U.S. Cl. 161—116 **4 Claims**

A synthetic resin moulded product has a moulded label equivalent portion. A mirror-like, smooth surface on the product has a predetermined pattern. A coarse surface on other parts are formed with a pattern having extremely minute and fine projections and depressions. The label equivalent portion indicates the predetermined pattern by a contrast of lusterless parts and lustrous parts. The manufacturing method produces the synthetic resin moulded product with the label equivalent portion.

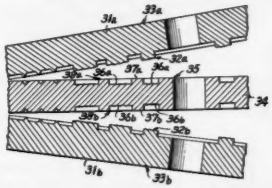


3,787,275

PHONOGRAPH RECORD DISC

Susumu Genma, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama-city, Kanagawa-ken, Japan

Filed May 24, 1971, Ser. No. 146,045
Claims priority, application Japan, May 25, 1970, 45/44661
Int. Cl. B32b *3/00*
U.S. Cl. 161—116 **3 Claims**



A synthetic resin moulded product has a moulded label equivalent portion having mirror-like smooth surface parts with a pattern and coarse surface parts in parts other than the pattern. The coarse surface parts have extremely small minute projections and depressions over the whole surface thereof, and also undulating uneven parts with another pattern. The label equivalent portion indicates the one pattern by a contrast of the lusterless parts formed by the coarse surface and the lustrous parts of the smooth surface, and at the same time indicates another pattern by the undulating uneven contour in the coarse surface. The manufacturing method forms the synthetic resin moulded product with the label equivalent portion.

3,787,276

CORRUGATED CARDBOARD CONTAINING SULPHUR FOAM

Guy J. Jacquelin, Boulevard du Marechal Joffre, 38 Grenoble, France

Filed Apr. 12, 1971, Ser. No. 133,016
Claims priority, application France, Apr. 13, 1970, 7013233
Int. Cl. B32b *1/00, 3/28*
U.S. Cl. 161—137 **2 Claims**

This invention relates to a new elementary material which is a corrugated cardboard comprising a corrugated sheet, made

of cellulosic material, with parallel corrugations, covered with at least one coating sheet and in which at least a part of the space between a face of said corrugated sheet and the corresponding coating sheet comprises a sulphur foam. The invention also relates to a process of manufacturing the above-defined material.

3,787,277

MONO-GRAIN LAYER MEMBRANE

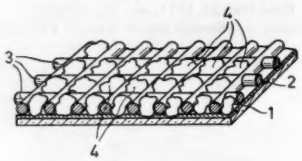
Joris Jan Cornelis Oomen, and Donald Robert Wolters, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 71,467, Sept. 11, 1970, abandoned. This application May 12, 1972, Ser. No. 252,669

Claims priority, application Netherlands, Sept. 18, 1969, 6914202

Int. Cl. B32b *5/16*

U.S. Cl. 161—87 **3 Claims**



A membrane comprising a film of synthetic resin in which a piece of wire gauze is embedded. The apertures of the piece of wire gauze accommodate grains which protrude through the surface on one or both sides of the film. Such a membrane may be used as a partition between two compartments. Dependent on the properties of the grains, molecules, ions and/or electrons may be transported selectively from one compartment to the other.

3,787,278

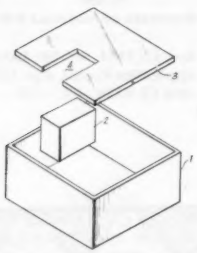
MOLDED MULTIPLE DENSITY POLYURETHANE FOAM

William C. Ready, East Haven; John E. Puig, Wallingford, and Bruce G. Van Leuwen, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 41,372, May 28, 1970, Pat. No. 3,658,972. This application Jan. 24, 1972, Ser. No. 220,517

Int. Cl. B32b *3/26*

U.S. Cl. 161—159 **4 Claims**



Molded, multiple density polyurethane foams and a process for their preparation are disclosed. The free rise of a polyurethane foam forming reaction mixture, placed in a mold, is constrained or limited in one or more sections of the mold. Then, after completion of the foam rise but before substantial curing, the foam, or a section thereof, is compressed to a fraction of its free rise volume and thereafter curing of the foam is completed.

Molded, multiple density foams are of particular utility in making bucket seats for use by the automotive industry.

3,787,279

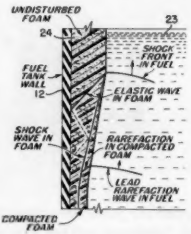
SHOCK AND FIRE ATTENUATING FUEL TANK

Henry F. Winchester, Cerritos, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 22, 1972, Ser. No. 255,369

Int. Cl. B32b *5/04*

U.S. Cl. 161—160 **2 Claims**



A self-sealing fuel tank subject to penetration by projectiles that is improved with the addition of a layer of rigid, fiber-reinforced foam material attached contiguous to the outside wall surface of the fuel tank to enhance the resealing of the punctured tank wall and to reduce the vulnerability of fires external and internal to the tank, and further improved by the application of a layer of a similar foam material as a liner inside the tank to reduce damage caused by hydraulic ram pressure effects.

3,787,280

RESINOUS PRODUCT HAVING SHARP COLOR DEFINITIONS THEREIN

Robert P. Conger, Park Ridge, and Seevaram N. Varadhacnary, North Plainfield, both of N.J., assignors to Congoleum Industries, Inc., Kearny, N.J.

Filed Mar. 16, 1971, Ser. No. 124,930

Int. Cl. B32b *5/16*; **B44f** *1/00*

U.S. Cl. 161—168 **14 Claims**

A method of producing extruded resinous products from a blend of variously colored resinous granules which contain multifunctional monomers which have been crosslinked in the formation of the chips together with other chips having no cross-linking monomer present, and the product so produced.

3,787,281

FORMING A HYDROLYTICALLY STABLE BOND BETWEEN GLASS AND POLYTETRAFLUOROETHYLENE

John A. Effenberger, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

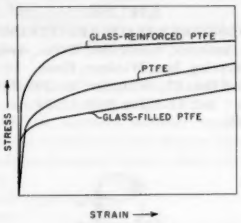
Filed Oct. 29, 1968, Ser. No. 771,574

Int. Cl. B32b *17/04, 27/28*

U.S. Cl. 161—188 **18 Claims**

Polytetrafluoroethylene is contacted with glass fiber coated

with either an amino-functional, water-hydrolyzable organo silane or methacrylato chromic chloride and sintered under an



inert atmosphere to obtain bonding between the glass and the polytetrafluoroethylene.

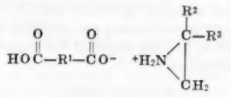
3,787,282

POLYESTERAMIDES PREPARED BY REACTING BETA-PROPIOLACTONE WITH AN AZIRIDINE SALT, A POLYCARBOXYLIC ACID, AND A POLYHYDRIC ALCOHOL

Ray C. Christena, Wichita; Earnest L. Johnston, Clearwater, and Ronald W. Whobrey, Wichita, all of Kans., assignors to Vulcan Materials Company, Birmingham, Ala.

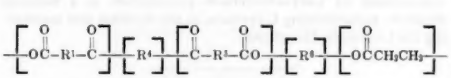
Filed Oct. 20, 1971, Ser. No. 190,819
Int. Cl. C08g *20/30*
U.S. Cl. 161—195 **10 Claims**

An improved polyesteramide is produced by reacting beta-propiolactone with an aziridine salt represented by the structural formula:



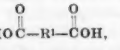
wherein R^1 represents a divalent radical such as alkylene, arylene, or aralkylene, wherein one or all of the hydrogen atoms thereof can be substituted with F, Cl, Br, lower alkyl and/or lower alkoxy; and where R^2 and R^3 represents monovalent radicals such as hydrogen, alkyl, or aryl;

and with a polycarboxylic acid, such as maleic or dimer acid, and with a polyhydric alcohol, such as castor oil or 1,6-hexane diol; the thus formed polyesteramide contains repeating units which may be represented by the structural formula:

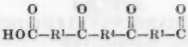


wherein R^1 has the meaning given above; R^4 represents a divalent radical such as aminoalkyleneoxy or oxyalkyleneamino; R^5 represents a divalent radical such as alpha-beta ethylenically unsaturated alkylidene; and R^6 represents a divalent radical such as alkylene or alkylidene.

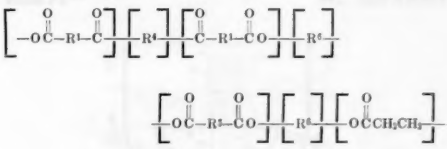
The above aziridine salt may also be reacted with an acid represented by the structural formula



wherein R^1 has the meaning given above, to yield a diacid represented by the structural formula



where R^4 has the meaning given above. The above diacid may then be reacted with beta-propiolactone, the polycarboxylic acid and the polyhydric alcohol to form an improved polyesteramide containing repeating units which may be represented by the structural formula



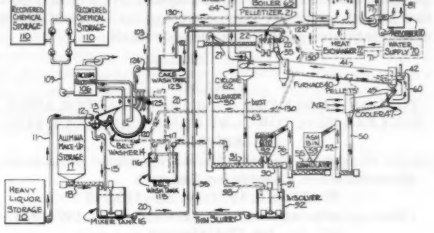
where R^1, R^4, R^5 and R^6 have the meanings given above.

3,787,283

TREATMENT OF WASTE LIQUOR FROM PULP PRODUCTION

Donald R. Sheeley; James H. Rion; William R. Cook, and William A. Biggs, Jr., all of Hartsville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Continuation-in-part of Ser. No. 37,184, May 14, 1970, abandoned. This application Mar. 28, 1972, Ser. No. 238,776
Int. Cl. D21c *11/02, 11/12*
U.S. Cl. 162—36 **9 Claims**



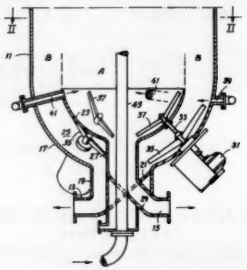
A process and apparatus for treating concentrated spent liquor from a soda-based pulping process to recover sodium for reuse in the pulping process and to prevent the usual pollution of streams and air caused by the usual effluent from the pulping process. The process and apparatus comprises the following steps and apparatus. Concentrated spent liquor containing sodium is mixed with recycled finely-divided reactive alumina hydrate and formed into solid pellets by spraying the concentrated liquor-aluminum hydrate mixture onto a bed of recycled sodium aluminate furnace ash in an enclosed rotating container and tumbling the mixture and ash. The solid pellets are combusted and reacted by feeding the pellets through a furnace operating at a temperature below the fusion temperature of sodium aluminate and at a sufficiently high temperature to combust the organic portion of the pellets and react the sodium content thereof with the alumina to form additional sodium aluminate as a particulate unfused ash. The resulting furnace ash is pulverized and a portion thereof is recycled for subsequent reuse in the treating process. The remaining portion of the ash is dissolved in water to form a solution of sodium aluminate. The sodium aluminate solution is reacted with either sulphur dioxide or carbon dioxide or both to form sodium sulfite and/or sodium carbonate pulping chemical and alumina and alumina is separated for reuse in the treating process.

3,787,284

DEVICE FOR DISCHARGING CELLULOSIC PULP FROM A DIGESTER

Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignor to Kamyr Aktiebolag, Karlstad, Sweden

Filed June 19, 1972, Ser. No. 264,240
Claims priority, application Sweden, June 22, 1971, 8073/71
Int. Cl. D21c 7/08
U.S. Cl. 162—246 2 Claims



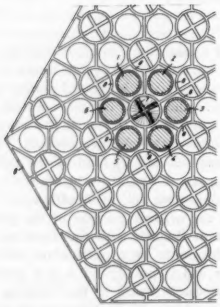
At least three sets of scraper devices are inserted in the bottom of a continuous cellulose digester for forwarding pulp passing along the axis of the digester and within a partition therein through a first discharge outlet, and pulp passing along the shell of the digester and outside said partition through a second discharge outlet. Each scraper device comprises a radially directed inclined shaft extending through the digester shell and said partition, said shaft carrying scraper arms sweeping the inside of a calotte-shaped portion of said partition as well as scraper arms sweeping the inside of a hemispherical bottom portion of the digester shell.

3,787,285

FUEL ASSEMBLY FOR A NUCLEAR REACTOR AND A NUCLEAR REACTOR CORE COMPRISING SUCH FUEL ASSEMBLIES

Jorgen Marstrand, Gentofte, Denmark, assignor to Atomenergikommissionen, Copenhagen, Denmark

Filed Feb. 8, 1971, Ser. No. 113,242
Claims priority, application Denmark, Feb. 13, 1970, 721
Int. Cl. G21c 3/32
U.S. Cl. 176—78 8 Claims



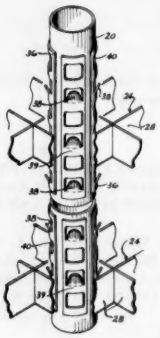
A fuel assembly in which the fuel rods are arranged in a hexagonal or square, regular pattern, but in which single rods are omitted systematically and deflectors substituted therefor, each deflector normally being situated in a duct, the partition of which consists of six or eight fuel rods, respectively. The deflectors are rigidly connected to grids between the fuel rods so that the rods may expand freely in the grids.

3,787,286

FUEL ASSEMBLY FLOW REDISTRIBUTION

Andrew James Anthony, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 17, 1971, Ser. No. 209,081
Int. Cl. G21c 3/32, 15/24
U.S. Cl. 176—78 5 Claims



Flow deflector apparatus is provided in fuel assemblies of a nuclear reactor to effect mixing of the coolant flowing in channels between adjacent members thereof. The apparatus comprises metal strips containing pre-punched tab projections that are attached to at least some of the members that comprise the fuel assemblies.

3,787,287

PROCESS FOR THE PRODUCTION OF L-TYROSINE

Hirohsi Hagino, Tokyo; Kiyoshi Nakayama, and Hajime Yoshida, both of Sagamihara, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed July 8, 1971, Ser. No. 160,933
Claims priority, application Japan, July 17, 1970, 45-62062
Int. Cl. C12d 13/06
U.S. Cl. 195—29 15 Claims

L-tyrosine is produced by culturing an L-tyrosine-producing strain of coryneform glutamic acid-producing bacteria represented by *Corynebacterium glutamicum* in a nutrient medium, accumulating L-tyrosine in the medium and recovering the L-tyrosine therefrom.

3,787,288

METHOD FOR PREPARING ALPHA-AMINOBENZYLPENICILLIN

Yoshinobu Miyamura, Hofu; Fumio Kato, Shizuoka, and Ryo Okachi, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1970, Ser. No. 80,773
Claims priority, application Japan, Oct. 16, 1969, 44-82241
Int. Cl. C12d 9/20
U.S. Cl. 195—36 P 10 Claims

A process for the selective production of α-amino-benzylpenicillin from 6-aminopenicillanic acid, functional derivatives thereof and acid addition salts thereof whereby the reaction takes place in the presence of an α-aminobenzylpenicillin producing enzyme derived from a microorganism belonging to the genum Pseudomonas. Especially suitable are *Pseudomonas melanogenum* and *Pseudomonas ovalis*.

3,787,289

METHOD OF PRODUCING DEXTRANASE

Randall Scott Davis, La Habra, and Don Lee Isenberg, Irvine, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 30, 1971, Ser. No. 176,314
Int. Cl. C12d *13/10*
U.S. Cl. 195—65 9 Claims

The instant disclosure relates to a method of obtaining an extracellular endodextranase enzyme. The method involves inoculating into an aqueous nutrient medium containing dextran and an assimilable nitrogen source, thereby forming a culture, an aerobic bacterial strain which has the following characteristics:

gram reaction — positive
shape — rods
motility — positive
spores — sporulation difficult to demonstrate in nutrient agar but easier in growth limiting medium such as citrate, sporangia definitely swollen
agar colonies — round, opaque
glucose agar — positive for growth, acid from glucose using peptone as a source of nitrogen
growth factors — slight if any growth in minimal media
catalase — positive
lecithin — no hydrolytic zone formed
milk agar — positive zone of hydrolysis
starch — positive zone of hydrolysis
gelatine agar — positive zone of hydrolysis
glucose asparagine agar — scant growth
soybean agar — positive for growth
nutrient broth — uniform turbidity followed by clearing and formation of sediment
sodium chloride (NaCl) broth — after 2 days incubation, growth in 5% NaCl broth, no growth in 7% NaCl broth
nitrites — not produced from nitrates
citrate — not utilized
tyrosine agar — red-brown pigment after 2 days.

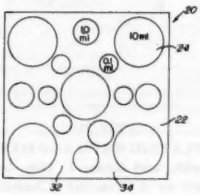
The culture is then incubated until extracellular endodextranase is elaborated therein. The bacteria are thereafter separated, thereby leaving a solution containing the extracellular endodextranase enzyme. The aerobic bacterial strains used in this method are also disclosed.

3,787,290

METHOD AND MEANS FOR ASSAYING BIOLOGICAL FACTORS DEMONSTRATING QUANTAL RESPONSE

Saul Kaye, 1001 Ridge Ct., Evanston, Ill.

Filed Apr. 10, 1972, Ser. No. 242,707
Int. Cl. C12k *1/04*
U.S. Cl. 195—103.5 R 11 Claims



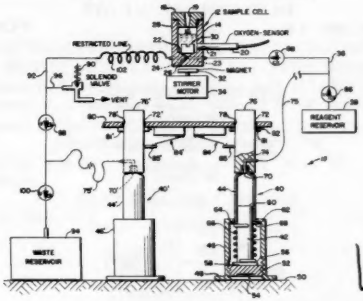
Method and apparatus for sampling a system to obtain a series of aliquots from the system in a single step and for inoculating a correlated series of sample-accepting zones in a single procedural step, each zone including indicator means for manifestation of organism growth in the zone, whereby quantal response and a measure of the concentration of biologically active entities contained in the system being analyzed may be conveniently and accurately determined.

3,787,291

LIQUID ANALYSIS APPARATUS

Rudolf Deuringer, El Toro; Robert A. Ray, and James C. Sternberg, both of Fullerton, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Division of Ser. No. 816,329, April 15, 1969, Pat. No. 3,701,716. This application Nov. 29, 1971, Ser. No. 203,094
Int. Cl. C12k *1/10*
U.S. Cl. 195—127 2 Claims



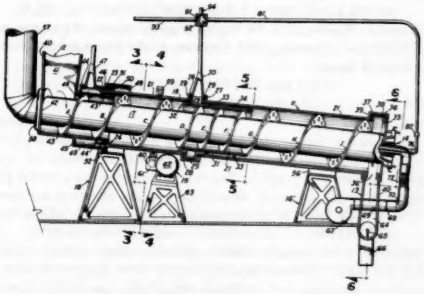
An apparatus for batch analysis of liquid samples wherein syringes are employed for delivering repeatable volumes of reagent to a cell prior to the addition of a sample and for withdrawing liquid from the cell after analysis thereof. Sensing means, such as a polarographic oxygen sensor, is mounted in the side wall of the cell with it sensing end contacting the liquid therein. A stirring element is positioned within the cell and rotated about the vertical axis of the cell so that a high tangential stirring force is produced to promote mixing of sample with reagent and to optimize sensor performance, yet only small sample volumes are required. The apparatus is particularly suited for rate sensing batch analysis of biological fluids such as blood or urine.

3,787,292

APPARATUS FOR PYROLYSIS OF WASTES

Ernest W. Keappler, 1015 Pegg Rd., East Point, Ga.

Filed Aug. 13, 1971, Ser. No. 171,480
Int. Cl. C10b *1/10*
U.S. Cl. 202—118 9 Claims



Method and apparatus for the pyrolysis of solid wastes including a retort defining a plurality of interior temperature zones, a heating means disposed through said retort, a means

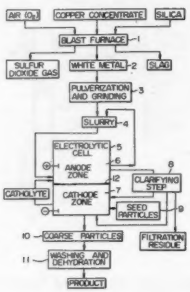
for rotating said retort about said heating means, a waste infeed, a residue outlet, and at least one fluid exhaust means communicating with the interior of said retort.

3,787,293

METHOD FOR HYDROELECTROMETALLURGY

Hiroshi Kametani, Hatogaya, Japan, assignor to Director of National Research Institute for Metals, Tokyo, Japan

Filed Feb. 3, 1971, Ser. No. 112,180
Int. Cl. C22d 1/16, 1/14, 1/18
U.S. Cl. 204—1 R 9 Claims



A hydroelectrometallurgy method comprising suspending particles of a crude metal or metal sulfide in the anode zone and seed particles of pure metal in the cathode zone, causing such particles to collide with the surfaces of the anode and cathode, respectively, and thereby effecting the corresponding electrochemical reaction on each of the particles, whereby metal ions are formed in the anode zone and the seed particles grow into coarse particles in the cathode zone as the result of precipitation of the metal thereon. According to this method, since the total surface area of the particle is very large, a greater electric current can be applied as compared with the conventional electrolytical refining or winning method, and the manufacturing rate of pure metal can be increased greatly.

3,787,294

PROCESS FOR PRODUCING A SOLID LUBRICANT SELF-SUPPLYING-TYPE CO-DEPOSITED METAL FILM

Shigehiko Kurosaki, 8-14 Nagisa Higashi-machi, Hirakata, and Yoichiro Okamoto, 609 Gakuen Asahi Moto-machi, Nara, both of Japan

Filed Dec. 7, 1971, Ser. No. 205,726
Int. Cl. C23b 7/00; B01k 5/00
U.S. Cl. 204—16 4 Claims

A process for producing a solid lubricant self-supplying-type co-deposited metal film in which fine powder of inorganic polymer of graphite fluoride is dispersed in a metal plating bath in the presence of a co-deposition assisting surfactant having C - F bond in molecules selected from the group comprising cationic surfactants, nonionic surfactants and amphoteric surfactants which exhibit cationic characteristic at the pH value of a particular plating bath employed with or without levelling and brilliance imparting agents and a metal coating or film is deposited on a substrate so as to co-deposit graphite fluoride in the metal coating. A mechanical part having a graphite fluoride co-deposited metal coating thereon produced by the process. A metal plating bath employed in the process.

3,787,295

METHOD OF ELECTROLYTIC COLORING OF OXIDE LAYERS ON ALUMINUM AND ALUMINUM BASE ALLOYS

Fritz Endinger; Walter Zweifel, both of Neuhausen, and Fritz Schneeberger, Schaffhausen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 1, 1971, Ser. No. 130,484
Claims priority, application Switzerland, Apr. 2, 1970, 4867/70
Int. Cl. C23b 9/02
U.S. Cl. 204—35 N 7 Claims

Method for electrolytic coloring of oxide layers produced by anodisation on aluminum and aluminum alloys, in at least two color sequences, consisting in using one coloring electrolyte which contains at least two metal salts of which each one renders different colors to the others, for example copper and tin salts, the different color sequences being obtained by adjusting the electrolysis AC-current voltage adequately. The counter electrode may be of the same metal that is dissolved in form of a salt in the electrolyte.

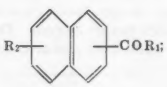
3,787,296

NON-POISONOUS ZINC PLATING BATHS

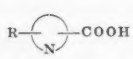
Hidenori Hayashida, 210 Higashi Amakawa-cho, Takatsuki, and Ryoji Nakahara, 440 Deguchi, Hirakata, both of Japan

Filed Apr. 7, 1971, Ser. No. 132,218
Claims priority, application Japan, Apr. 24, 1970, 45-34717
Int. Cl. C23b 5/12, 5/46
U.S. Cl. 204—55 R 5 Claims

A non-poisonous zinc plating bath comprising a fundamental plating composition including zinc salt and ammonium salt with or without hydroxy carboxylic acid; a sulfate compound or compounds having the general formula $A - B - CH_2CH_2O_{2-100}SO_3M$; an alkylnaphthylketon compound or compounds having the general formula



and a nitrogen-containing heterocyclic ring compound or compounds substituted with carboxyl group having the general formula



or mixture thereof.

3,787,297

ZINC PLATING BATH AND METHOD

Merton M. Beckwith, and Grace F. Hsu, both of Rockville, Conn., assignors to Conversion Chemical Corporation, Rockville, Conn.

Filed Oct. 26, 1971, Ser. No. 192,624
Int. Cl. C23b 5/12
U.S. Cl. 204—55 R 21 Claims

An aqueous bath for producing zinc electrodeposits upon metallic surfaces has a pH of 4.0 to 9.0 and contains zinc ion, chloride ion, and a surface-active constituent including at least one N-acylated sarcosine derivative. Preferably, the bath also contains one or more auxiliary surface-active agents, and it may in addition include brighteners, buffering agents, chelating agents, etc.

3,787,298

ANODIZING ALUMINUM FOAMS

Leonard M. Niebylski, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 9, 1971, Ser. No. 170,335
Int. Cl. C23b 9/02
U.S. Cl. 204—58 3 Claims

Strength of metal foams is enhanced by anodizing. The strength increase may not be immediately apparent, but may require aging. Anodization is preferably carried out by applying voltage across a cathode (in contact with the electrolytic bath) and the foam anode and then immersing the anode in the bath. Improved results are also obtained if surfaces not to be anodized are not contacted with the electrolytic bath. The electrolyte can optionally contain a fluorine acid such as HF and HBF_4. These tend to make the foam less porous. Preferred foams are made of aluminum base metals.

3,787,299

ELECTROLYTIC CONDENSATION OF CARBOXYLIC ACIDS

Fritz Beck, Ludwigshafen; Juergen Haufe, Lambsheim, and Heinz Nohe, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda- Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Mar. 22, 1971, Ser. No. 126,943
Claims priority, application Germany, Mar. 28, 1970, 2014985
Int. Cl. C07c 69/34, 67/00; C07b 29/06
U.S. Cl. 204—59 R 7 Claims

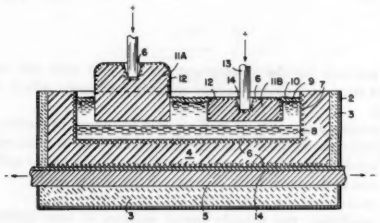
Process for the electrochemical condensation of carboxylic acids in a solvent, in which the electrolyte is caused to flow at a rate of from 0.05 to 2 m/sec between pairs of electrodes which are impermeable to liquids and are spaced from 0.1 to 2 mm apart.

3,787,300

METHOD FOR REDUCTION OF ALUMINUM WITH IMPROVED REDUCTION CELL AND ANODES

Arthur F. Johnson, 203 Creole Ln., North Gate Urban Farms, Franklin Lakes, N.J.

Division of Ser. No. 172,047, Aug. 16, 1971. This application Sept. 13, 1972, Ser. No. 288,706
Int. Cl. C22d 3/12; B01k 3/04, 3/08
U.S. Cl. 204—67 4 Claims



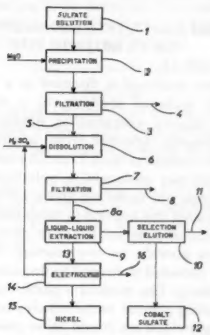
A system for the fused floride electrolysis of aluminum in a potcell wherein a carbonaceous anode and potlining are preserved against deterioration by impregnating their respective surfaces with a pitch-fluoride mixture and a pitch-graphite mixture. Atmospheric oxidation of anode surfaces is prevented so maximum anode cross sectional area is preserved and, hence, has minimum resistance for current travel through the anode and through the underlying electrolyte. The more dense carbon surface also reduces corner erosion of anodes. Impregnation is preferably carried out with one or more applications of aluminum fluoride suspended in a high melting, low volatile coal tar pitch. An improved potlining protects against electrolyte penetration and circulating metal erosion of the potlining surface, and improves conductivity; the lining bottom is sealed and smoothed with graphite suspended in molten pitch, which is absorbed by capillary attraction, and which increases conductivity. The lining walls are sealed and smoothed with a similar mixture of fluorspar and pitch, which decreases conductivity.

3,787,301

ELECTROLYTIC METHOD FOR PRODUCING HIGH-PURITY NICKEL FROM NICKEL OXIDE ORES

Christian H. Bozec; Bernard G. Dulong, both of Le Havre, and Robert Y. Lemarinel, Sainte-Adresse, all of France, assignors to "Le Nickel," Vervile Propriete, Paris, France

Filed Mar. 28, 1972, Ser. No. 238,774
Claims priority, application France, Mar. 29, 1971, 71.10924
Int. Cl. C22d 1/14; C22b 23/06
U.S. Cl. 204—112 7 Claims



A method for recovering nickel from nickel containing ores comprises:

lixiviating the ore in sulphuric acid and neutralizing the resulting solution until it reaches a pH between 3.5 and 4;

adding to said solution a precipitation agent to obtain a nickel hydroxide precipitate;

dissolving said precipitate in a slight excess of sulphuric acid, and removing the dissolution residue;

purifying the solution resulting from the preceding step by liquid-liquid extraction with an organic phase containing a sulphonium salt, and eluting said organic phase to recovering cobalt; and

subjecting said solution to an electrolysis to recover high-purity nickel.

3,787,302

PHOTO-SENSITIVE CROSS-LINKING AGENTS FOR HIGH MOLECULAR WEIGHT MATERIALS

Ichiro Ijichi; Sajiro Maeda; Satoru Kubo, and Takamori Tomomoto, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

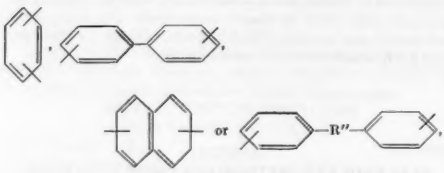
Filed Oct. 19, 1970, Ser. No. 82,219
Int. Cl. B01j 1/10; C08f 1/20
U.S. Cl. 204—159.2 8 Claims

The present invention provides novel photo-sensitive cross-linking agents for high molecular weight materials comprising

aromatic polyaldehydes and derivatives thereof, of the formula:

CHO–R–CHO

wherein R is an aromatic radical of the formulae:



a divalent benzene ring, a substituted divalent benzene ring or a divalent polycyclic aromatic ring. The afore-mentioned formulae may be substituted by a variety of groups described hereinafter in the specification. However, ortho-dialdehydes are excluded from the scope of the present invention.

3,787,303

RADIATION CURABLE POLYENE-POLYTHIOL COATING COMPOSITIONS

James L. Guthrie, Ashton, and Francis J. Rendulic, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 17, 1971, Ser. No. 209,369
Int. Cl. B01j *1/10, 1/12*
U.S. Cl. 204—159.15 **8 Claims**

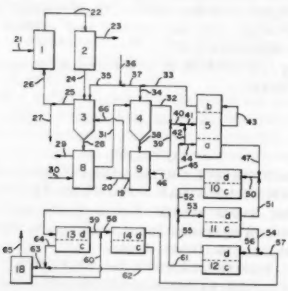
The invention disclosed is directed to a method for overcoating which includes applying to a substrate a novel photocurable lacquer composition having as essential ingredients a polyene selected from a particular group of polyenes which contain at least 2 reactive unsaturated carbon-to-carbon bonds per molecule, a polythiol containing 2 or more thiol groups per molecule and a resin component; and thereafter exposing the applied composition to actinic radiation for a period of time sufficient to photocure the applied composition to provide an overcoating. Optionally, a sensitizer may be included if desired to decrease curing time and improve efficiency. The method is particularly useful for high speed overcoating printed metal articles such as cans. Overcoatings thus provided are found to be characterized by high strength, good scratch resistance, freedom from tackiness and excellent transparency.

3,787,304

PRODUCTION OF HF FROM FLUORINE BY-PRODUCTS

Frederick P. Chlanda, Rockaway, and Kang-Jen Liu, Somerville, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 31, 1972, Ser. No. 222,013
Int. Cl. B01d *13/02*
U.S. Cl. 204—180 P **5 Claims**



Fluorine values are recovered from fluosilicic acid aqueous streams by electrodialytic water-splitting of fluoride salt to hydrofluoric acid and hydroxide base and further optionally concentration of the hydrofluoric acid via membrane electrodialysis, to produce anhydrous HF.

3,787,305

METHOD OF APPLYING A COATING TO A PART

Norman Edmund Ballard, Derby, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed June 12, 1972, Ser. No. 261,814
Claims priority, application Great Britain, June 17, 1971, 28369/71
Int. Cl. C23b *13/00*
U.S. Cl. 204—181 **14 Claims**

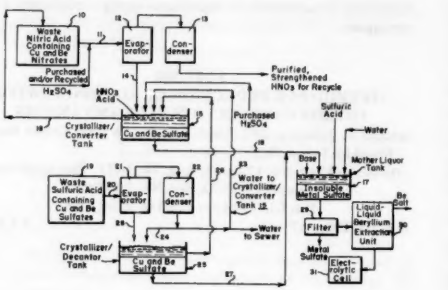
The invention comprises a method of applying a coating to a steel part in which a coating of aluminium powder and organic resin is electrophoretically applied to the part, the coating is heated to drive off the resin, and the aluminium coating is impregnated with a high temperature resistant base material.

3,787,306

PROCESS FOR THE CONCURRENT RECOVERY OF ACID AND METAL VALUES FROM SPENT PICKLE ACID CONTAINING THE SAME

Franklin C. Senior, Phoenix, Ariz., and Douglas MacGregor, Murray, Utah, assignors to Cationic Corporation, New York, N.Y.

Filed Oct. 20, 1971, Ser. No. 190,882
Int. Cl. C22d *1/14, 1/16, 1/24*
U.S. Cl. 204—105 R **13 Claims**



A process for the concurrent recovery of acid and metal values from spent pickle acid containing the same which comprises:

a. adding a quantity of sulfuric acid to the spent pickle acid other than sulfuric acid at least sufficient to convert the soluble salts in the pickle acid to soluble metal sulfates and at the same time, regenerate the pickle acid;

b. recovering the pure pickle acid by distillation;

c. oxidizing the soluble metal sulfates if iron sulfate is present to insoluble metal hydroxides;

d. neutralizing any excess sulfuric acid which may be present with a base to form an insoluble metal sulfate;

e. adding a quantity of sulfuric acid sufficient to convert the insoluble metal hydroxides other than ferric hydroxide which may be present to soluble sulfate salts;

f. removing the insoluble ferric hydroxide and/or insoluble metal sulfate, is present, by filtration to result in a filtrate containing iron-free soluble metal sulfates;

g. adjusting the pH and the concentration of the filtrate to that suitable for an electroplating solution; and

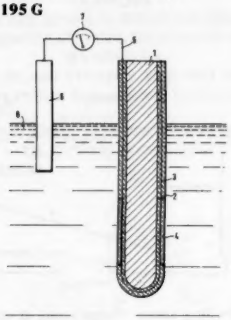
h. recovering the metals from the electroplating solution by electrolysis.

3,787,307

SENSING ELEMENT TO SENSE IONS IN LIQUIDS

Alfred Schwab, Ketsch, and Rudolf Ehret, Schwetzingen, both of Germany, assignors to Pfaudler-Werke AG, Schwetzingen, Germany

Filed Oct. 13, 1971, Ser. No. 188,885
Claims priority, application Germany, July 15, 1971, 2133419
Int. Cl. G01n 27/36
U.S. Cl. 204—195 G 13 Claims



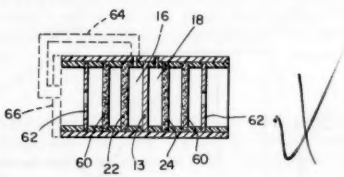
A mechanically stable, solid, rod-like metallic carrier body has a base enamel layer fused thereover, on a portion of which a glass electrode is fused as a top cover; a top enamel layer is fused to the remainder of the base enamel layer, the base enamel layer can be of sufficient conductivity so that an electric potential can be sensed from the metallic body, or an electrical conductor, in contact with the glass, which can be fused between the enamel layers. A plurality of glass electrodes, of different response to ions can be placed on the same enameled metal carrier and separately connected to sensing apparatus.

3,787,308

OXYGEN SENSOR

Francis P. Malaspina, Yardley; Wesley E. Aker, Malvern, both of Pa., and John Werth, Princeton, N.J., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Feb. 16, 1972, Ser. No. 226,937
Int. Cl. G01h 27/26, 27/28; G01n 27/46
U.S. Cl. 204—195 P 20 Claims



A comparator element for gaseous oxygen comprises a first and a second oxygen-inert metal electrochemical cell. The first cell is fed with an oxygen containing gas of known oxygen content and the second cell is fed with a gas of unknown oxygen content. The design of the electrochemical cells is such that their electrical resistance when current is passed therethrough is inversely proportional to the oxygen content of the feed gas over a useful range. By comparing the resistances of the two cells, an accurate determination of the oxygen content of the unknown gas may be made with self compensation for ambient temperature. The range of the instrument may be increased by restricting the flow of gas to the oxygen electrodes. This may be accomplished by flowing the gas through a diffusion membrane and an orifice. Oxygen evolved from the metal electrode of the standard cell may be used to feed the oxygen electrode of the same cell thus providing a self sustaining standard atmosphere. The comparator may be compensated for pressure by providing pressure equalizing means between the gas feed to the first cell and the gas feed to the second.

3,787,309

SPECIFIC ION ELECTRODE AND METHOD OF MAKING SAID ELECTRODE

Radhakrishna Murty Neti, Brea; Kenneth B. Sawa, Buena Park, and Colin C. Bing, Placentia, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 68,587, Aug. 31, 1970, abandoned.
This application May 30, 1972, Ser. No. 257,987
Int. Cl. G01n 27/46
U.S. Cl. 204—195 M 20 Claims

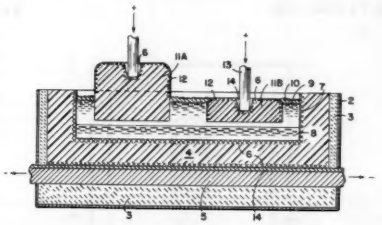
A diffusion membrane material for a specific ion electrode which comprises a polymeric resin and a substantially water insoluble salt of the ion to be detected in admixture therewith. A method of making a diffusion membrane material for a specific ion electrode is also disclosed. The method comprises the steps of mixing a polymeric resin with a substantially insoluble salt of the ion to be detected. The resultant mixture is molded and sintered to provide a bar stock and the bar stock is formed into a diffusion membrane material.

3,787,310

REDUCTION OF ALUMINUM WITH IMPROVED REDUCTION CELL AND ANODES

Arthur F. Johnson, 203 Creole Ln. North Gate Urban Farms, Franklin, N.J.

Division of Ser. No. 172,047, Aug. 16, 1971. This application Sept. 13, 1972, Ser. No. 288,600
Int. Cl. C22d 3/02; B01k 3/06, 3/08
U.S. Cl. 204—243 R 6 Claims



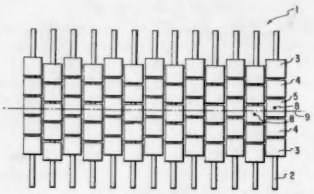
A system for the fused floride electrolysis of aluminum in a potcell wherein a carbonaceous anode and potlining are preserved against deterioration by impregnating their respective surfaces with a pitch-fluoride mixture and a pitch-graphite mixture. Atmospheric oxidation of anode surfaces is prevented so maximum anode cross sectional area is preserved and, hence, has minimum resistance for current travel through the anode and through the underlying electrolyte. The more dense carbon surface also reduces corner erosion of anodes. Impregnation is preferably carried out with one or more applications of aluminum fluoride suspended in a high melting, low volatile coal tar pitch. An improved potlining protects against electrolyte penetration and circulating metal erosion of the potlining surface, and improves conductivity; the lining bottom is sealed and smoothed with graphite suspended in molten pitch, which is absorbed by capillary attraction, and which increases conductivity. The lining walls are sealed and smoothed with a similar mixture of fluorspar and pitch, which decreases conductivity.

3,787,311

CATHODE FOR THE WINNING OF ALUMINUM

Hubert Wittner, Ludwigshafen-Mundenheim, and Kurt Lauer, Schriesheim, both of Germany, assignors to Gebr. Giulini GmbH, Ludwigshafen am Rhein, Germany

Filed Dec. 13, 1971, Ser. No. 207,457
Claims priority, application Germany, Dec. 12, 1970, P 20 61 263.9
Int. Cl. B01k 3/08; C22d 3/02
U.S. Cl. 204—294 2 Claims



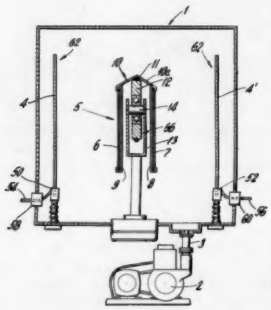
In the winning of aluminum by the electrolysis of alumina dissolved in molten electrolyte, wherein the electrolysis current passes through the surface of a carbon cathode, the electrolysis current is equalized over the surface of the carbon cathode.

3,787,312

DEVICE FOR PASSING SUBSTRATES THROUGH A VAPOR DEPOSITION ZONE

Rudolf Wagner, Buchs, and Roman Schertler, Wolfurt, both of Switzerland, assignors to Balzers Patent-und Beteiligungs Aktiengesellschaft, Balzers, Liechtenstein

Filed Sept. 14, 1972, Ser. No. 289,066
Claims priority, application Switzerland, Sept. 21, 1971, 13822/71
Int. Cl. C23c 15/00
U.S. Cl. 204—298 8 Claims



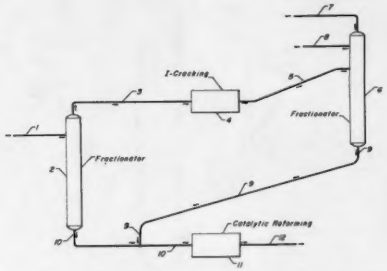
A device for coating substrates in a vacuum plant comprising a vacuum chamber which is adapted to be subjected to reduced pressures and which includes at least one pair of laterally spaced sources for producing a deposition vapor current of the material to be coated in a deposition zone therebetween. A conveyor is movable through the chamber and through the deposition zone. A slider shield carrier extends over the conveyor and is supported thereon for movement through the deposition zone and provides a covering to shield the conveyor parts against the deposition of the material thereon. The substrates are supported preferably on each side of the slider shield carrier and they are moved with the carrier on the conveyor to expose them to the vapor deposition current.

3,787,313

PRODUCTION OF HIGH-OCTANE, UNLEADED MOTOR FUEL

Ernest L. Pollitzer, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 21, 1972, Ser. No. 308,352
Int. Cl. C10g 39/00
U.S. Cl. 208—60 10 Claims



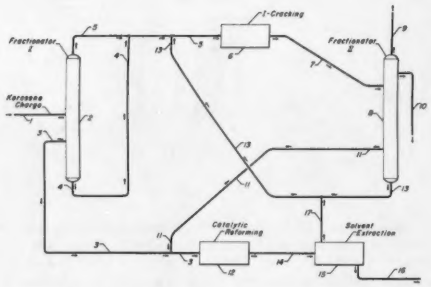
A naphtha boiling range charge stock is converted into a motor fuel which does not necessitate the incorporation of metal-containing additives otherwise required for suitable anti-knock characteristics. The process involves a combination of hydrocracking and catalytic reforming, and is effected in a manner which significantly decreases the quantity of methane and ethane produced. The novel form of hydrocracking results in a product predominantly comprising naphthenic hydrocarbons and highly branched paraffins, the latter being predominantly isobutane. Following separation to recover the isobutane, catalytic reforming is utilized to dehydrogenate the naphthenic compounds to produce an aromatic concentrate.

3,787,314

PRODUCTION OF HIGH-OCTANE, UNLEADED MOTOR FUEL

George R. Donaldson, Barrington, and Ernest L. Pollitzer, Skokie, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 21, 1972, Ser. No. 308,353
Int. Cl. C10g 39/00
U.S. Cl. 208—60 10 Claims



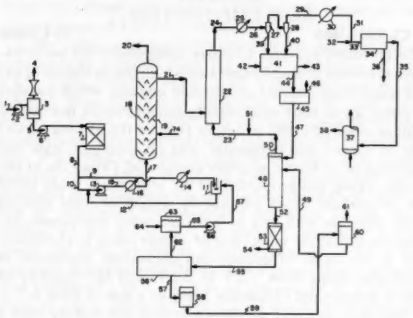
A charge stock containing kerosene boiling range hydrocarbons is converted into a high-octane motor fuel which does not require the use of metal-containing additives otherwise needed for suitable anti-knock characteristics. The process involves a combination of hydrocracking and catalytic reforming, and is effected in a manner which significantly increases the quantity of normally liquid motor fuel product. The novel

form of hydrocracking results in a product predominantly comprising naphthenic hydrocarbons and highly-branched paraffins, the latter being rich in isobutane. Following separation to recover the isobutane, catalytic reforming is utilized to dehydrogenate the naphthenic compounds, and dehydrocyclisize paraffinic hydrocarbons, to produce an aromatic concentrate.

3,787,315
ALKALI METAL DESULFURIZATION PROCESS FOR PETROLEUM OIL STOCKS USING LOW PRESSURE HYDROGEN

Roby Bearden, Jr., and Thomas E. Fink, both of Baton Rouge, La., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed June 1, 1972, Ser. No. 258,555
Int. Cl. C10g *19/00, 17/00*
U.S. Cl. 208—208 M **19 Claims**



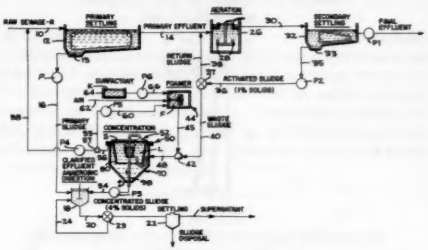
Low sulfur-content petroleum oil stocks are prepared by contacting a sulfur-containing oil stock with an alkali metal, preferably sodium, or an alkali metal alloy, preferably sodium/lead, thereby producing a mixture comprising a low sulfur content oil containing alkali metal salts dispersed therein. The alkali metal treating step is conducted in the presence of low pressure hydrogen, i.e., 25 to 500 psig. The resulting mixture is then treated with either water or H_2S thereby disengaging a substantial portion of the salts from the oil. The salt phase is then blended with a molten sulfur-rich alkali metal polysulfide thereby forming a sulfur-depleted alkali metal polysulfide which is subsequently decomposed electrolytically to form alkali metal.

3,787,316
FOAM FLOTATION CONCENTRATION OF SEWAGE

Edwin H. Brink, San Jose, and Warren G. Palmer, Santa Clara, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Division of Ser. No. 6,868, Jan. 29, 1970, Pat. No. 3,642,617.
This application Nov. 22, 1971, Ser. No. 200,841
Int. Cl. C02c *1/14, 1/26*
U.S. Cl. 210—6 **2 Claims**

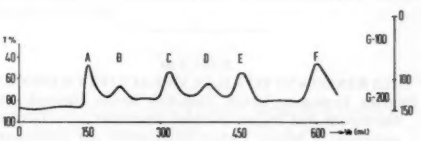
A suspension of activated sludge from a secondary settling tank is concentrated by a bubble flotation process. Air is forced through a mixture of water and a surfactant in a shear type foamer at low pressure to produce a stable foam of small air bubbles in water. The foam is pumped into the suspension entering the concentrator and the bubbles attach to the solids in the suspension. The mixture of foam and suspension is released within a baffle in the concentrator tank, causing the surfactant shielded air bubbles to lift the solids to which they have become attached and form a blanket of concentrated sludge. A rotating skimmer head removes an upper layer of the sludge blanket whereas the clarified effluent flows under the baffle and out over an annular weir for discharge. The concentrated sludge removed from the concentrator is introduced into an anaerobic digester, along with primary sludge from the primary settling tank of the system. One overall effect is to reduce the size required for the digester.



3,787,317
PROCESS FOR THE CHROMATOGRAPHIC SEPARATION OF MIXTURES

Dieter Jaworek, Tutzing/Obb, Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Apr. 15, 1971, Ser. No. 134,256
Claims priority, application Germany, Apr. 28, 1970, P 20 20 789.0
Int. Cl. B01d *15/08*
U.S. Cl. 210—31 C **13 Claims**



Mixtures of substances are resolved into their components by use of molecular sieve and/or ion exchangers wherein at least two different molecular sieve chromatographic separation materials, and optionally an ion exchange chromatographic separation material; are arranged directly behind one another, at least one ion exchange material and/or molecular sieve material being followed by at least one molecular sieve material. Examples of materials separated are dextran blue (A), catalase (B), haemoglobin (C), chymotrypsin (D), cytochrome C (E), and dinitrophenyl-asparaginic acid (F).

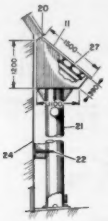
3,787,318
SOLIDS-LIQUID SEPARATOR

John R. Coleman, Jr., Burghausen, Germany, assignor to Marathon Oil Company, Findlay, Ohio

Filed Apr. 20, 1972, Ser. No. 246,036
Int. Cl. B01d *39/10*
U.S. Cl. 210—65 **6 Claims**

Wet lumps of solid, together with free liquid, e.g., coke from a coke drum, fall onto a sloped deflector formed of parallel

spaced angle irons or bars. The solids bounce off the deflector onto a storage plow while the free liquid, together with liquids



shaken from the solids, run downward between the spaced angle irons or bars.

3,787,319

AMINE/PHOSPHATE COMPOSITION USEFUL AS CORROSION AND SCALE INHIBITOR

Arthur Lee Larsen, Denver, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Division of Ser. No. 812,847, April 2, 1969, abandoned. This application Oct. 18, 1971, Ser. No. 190,266

Int. Cl. C23f *11/16*

U.S. Cl. 252—8.55 E **10 Claims**

A composition useful as a corrosion and scale inhibitor is obtained by reacting an N-secondary alkyl alkylene diamine (e.g., contains an average of eight–20 carbon atoms in the alkyl group and two–four carbons atoms in the alkylene group) and a phosphate ester, obtained for example by reacting about equal molar amounts of polyphosphoric acid and a condensation product of an aliphatic primary alcohol (preferably contains three–six carbon atoms) and at least 1 mole (preferably 1–10 moles) of an alkylene oxide (preferably ethylene oxide). Final reaction product can have a pH of 5-9.

3,787,320

OILS RESISTANT TO HIGHLY REACTIVE CHEMICALS

Dietrich Erdmann; Istvan Namenyi; Bruno Hampel, all of Darmstadt, and Werner Herbert, Markdorf, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Feb. 17, 1971, Ser. No. 116,230

Claims priority, application Germany, Feb. 18, 1970, P 20 07 245.1

Int. Cl. C10m *1/30*

U.S. Cl. 252—54 **12 Claims**

Perfluoropolyether lubricating oils resistant to degradation by a variety of corrosive chemicals, including boron trifluoride, sulfur tetrafluoride and uranium hexafluoride, are characterized by being substantially free from components reactive to uranium hexafluoride.

3,787,321

CALIFORNIUM-PALLADIUM METAL NEUTRON SOURCE MATERIAL

Burton L. Dahlen, Aiken; Wilbur C. Mosly, Jr., New Ellenton; Paul K. Smith, and Edward L. Albenesius, both of Aiken, all of S.C., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed July 1, 1971, Ser. No. 158,999

Int. Cl. C01g *56/00*

U.S. Cl. 252—301.1 R **4 Claims**

Californium, as metal or oxide, is uniformly dispersed throughout a noble metal matrix, provided in compact, rod or wire form. A solution of californium values is added to palladium metal powder, dried, blended and pressed into a compact having a uniform distribution of californium. The californium values are decomposed to californium oxide or metal by heating in an inert or reducing atmosphere. Sintering the compact to a high density closes the matrix around the dispersed californium. The sintered compact is then mechanically shaped into an elongated rod or wire form.

3,787,322

CATALYST FOR PURIFICATION OF EXHAUST GASES FROM MOTOR VEHICLES AND INDUSTRIAL PLANTS

Edgar Koberstein, Alzenau, and Eduard Lakatos, Hurth-Hermulhein, both of Germany, assignors to Laporte Industries Limited, London, England and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation-in-part of Ser. No. 827,136, May 23, 1969, abandoned, and a continuation-in-part of Ser. No. 523,564, Jan. 28, 1966, abandoned. This application Jan. 25, 1971, Ser. No. 109,617

Int. Cl. B01f *11/06, 11/22*

U.S. Cl. 252—465 **18 Claims**

This invention provides a catalyst composition for use in oxidative reactions at high temperatures e.g., the oxidation of exhaust gases from internal combustion engines, which catalyst comprises an at least substantially homogeneous mixture of aluinium oxide of cubic structure (i.e., of the gamma series) oxide of copper and chromium, and optionally at least one compound of at least one other element of Group IIa of the Periodic Table, the proportion of the aluminium xoide being from 20 percent to 45 percent by weight of total catalyst weight, together with said at least one other compound, expressed as oxide, the mole ratio of copper oxide to chromium oxide in the oxide of copper and chromium, expressed as $CuO:Cr_2O_3$, being from 1.2:1 to 2.2:1, and the majority of oxide of copper and chromium being of a size of from 0.5 to 5μ. The invention also provides a process for making such a catalyst.

3,787,323

PRODUCTION OF ETHYLENE POLYMERS AND ETHYLENE COPOLYMERS

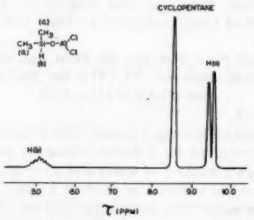
Itsuho Aishima, Tokyo; Hisaya Sakurai; Yukichi Takashi, both of Kawasaki; Hideo Morita; Yoshiyuki Hirotsu, both of Yokohama, and Tetsuo Hamada, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 840,187, July 9, 1969, abandoned. This application Nov. 17, 1971, Ser. No. 199,785

Claims priority, application Japan, July 16, 1968, 43/49654

Int. Cl. C08f *1/44, 3/06, 15/04*

U.S. Cl. 260—88.2 F **7 Claims**



The polymerization of ethylene and the copolymerization of ethylene with one alpha-olefin having three to 10 carbon

atoms in the presence of a catalyst prepared by the reaction between (A) at least one compound of the general formula;

$$R^1R^2HSiOAlX^1X^2$$

wherein R^1 and R^2 represent independently members selected from the group consisting of alkyl groups having one to five carbon atoms, cyclohexyl, phenyl and 1-naphthyl; X^1 and X^2 represent members selected from the group consisting of alkyls having one to five carbon atoms, cycloalkyls having four to six carbon atoms, phenyl, p-tolyl and halogens selected from the group consisting of Cl, Br and I and at least one of X^1 and X_2 represents said halogen, and (B) at least one compound selected from the group consisting of

1. TiX^3_p, VX^3_p, $TiX^3_{4-q}(OR^3)_q$, $VOX^3_{3-r}(OR^3)_r$ and VOX^3_3 wherein X^3 represents halogen selected from the group consisting of Cl, Br, and I; R^3 represents one member selected from the group consisting of alkyls having one to six carbon atoms, cyclohexyl, phenyl and p-tolyl; p is an integer of 2 to 4, q is an integer of 1 to 3; r is an integer of 1 to 2; and

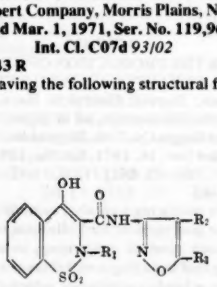
2. the solid compounds obtained by the reaction between one member selected from the group consisting of TiX^3_4, VX^3_4, $TiX^3_{4-q}(OR^3)_q$, $VOX^3_{3-r}$and VOX^3_3 and one member selected from the group consisting of $AlR^4_s(OR^5)_wX^3_{3-g}$, SiR^6_5H, $(R^7HSiO)_y$, $R^8R^9R^{10}SiO–(R^{11}HSiO)_t$-$SiR^{10}R^9R^8$ and a combination of one member selected from SiR^6_5H, $(R^7HSiO)_y$ and $R^8R^9R^{10}SiO–(R^{11}HSiO)_t$-$SiR^{10}R^9R^8$ and one member selected from $AlCl_3$, $AlBr_3$and $FeCl_3$ wherein R^3 and X^3 represent independently the same groups as defined above; R^4 and R^5 represents independently the same groups above-defined R^3; R^6, R^7, R^8, R^9, R^{10} and R^{11} represent independently the same groups as above-defined R^1 or R^2; q and r represent independently the same integers as above-defined; v is an integer of 1 to 3, w is 0 or an integer of 1 to 2, y is an integer of 1 to 3 and $v+w+y=3$; s is an integer of 3 to 6; t is at least one and the viscosity of $R^8R^9R^{10}SiO–(R^{11}HSiO)_t$-$SiR^{10}R^9B8$ is at most 2,000 centistrokes, the mole ratio of the compound (A) to the compound (B) being 0.5 – 5 : 1.

3,787,324
4-HYDROXY-3-(3-ISOXAZOLOCARBAMYL)-2H-1,2-BENZOTHIAZINE 1, DIOXIDES AND PROCESS FOR THEIR PRODUCTION

Harold Zinnes, Rockaway; Martin L. Schwartz, Gillette, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 1, 1971, Ser. No. 119,967
Int. Cl. C07d 93/02
U.S. Cl. 260—243 R 4 Claims

Compounds having the following structural formula are disclosed:



I

wherein R_1 is hydrogen or methyl and R_2, and R_3 are hydrogen or alkyl. These compounds are useful as anti-inflammatory agents, antipyretics, analgesics.

3,787,325
ALKYLAMINO SPIRO [12-H[1]BENZOPYRAN [3,2F]QUINOLINE-12,1'PHTHALIDE

Troy Eugene Hoover, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Nov. 16, 1970, Ser. No. 90,098
Int. Cl. C07d 33/48
U.S. Cl. 260—287 R 2 Claims

A chromogenic compound of normally colorless form is disclosed which is colorable to forms such as orange-red or red when brought into reactive contact with an acidic material. Examples of these chromogenic compounds include 6'-diethylamino-2'-thiomethylfluoran, 6'-diethylamino-2',3'-methylenedioxyfluoran or 9-ethylamino-spiro[12-H-benzo[1]xanthene-12, 1'-phthalide].

3,787,326
CHROMIUM (III) COMPOSITIONS AND THEIR PREPARATION

Alden J. Deyrup, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 119,608, March 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 25,097, April 2, 1970, abandoned. This application Dec. 22, 1971, Ser. No. 210,833
Int. Cl. C07f 11/00
U.S. Cl. 260—438.5 R 43 Claims

Coordination complexes of chromium (III) and fumaric acid and certain substituted fumaric acids; the preparation of aqueous solutions of such complexes; and the use of such solutions for treating metal, metal oxide and glass substrates for the purpose of improving the bonding thereto of subsequently applied organic polymer adhesives. Preferred coordination compounds of fumaric acid have the approximate formulas $[Cr(H_2O)(C_4H_3O_4)]_nX_2$, $[Cr(H_2O)_4(C_4H_2O_4)]_nX$, and $[Cr_2(H_2O)_{10}(C_4H_2O_4)]_nX_4$, where X is a noncoordinated anion and a is its valence. The preferred anion is nitrate. Also a method for treating substrates to improve adhesion of polymers thereto, by contacting the substrate with an aqueous solution of fumaric acid or certain substituted fumaric acids and a Cr^{+3} salt which yields the $Cr(H_2O)_6^{+3}$ ion, at 90°–100°C. and a pH of 1.8–2.4.

3,787,327
PROCESS FOR MANUFACTURING MINUTE CAPSULES HAVING POLYNITRILE CAPSULE WALLS

Donald D. Emrick, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Feb. 22, 1972, Ser. No. 228,228
Int. Cl. B01j 13/02; B44d 1/02
U.S. Cl. 252—316 2 Claims

A process is disclosed by which minute capsules can be manufactured, en masse, and wherein the capsule wall material includes a polymeric nitrile composition. The process is disclosed to be one of liquid-liquid phase separation of the polymeric nitrile capsule wall material and the phase separation is disclosed to be accomplished from a vehicle of an aqueous solution relatively concentrated in inorganic salt. The phase separation is accomplished by diluting the vehicle to a point where the nitrile polymer is no longer soluble.

3,787,328
METHOD OF REDUCING EMISSION OF POLLUTANTS IN EXHAUST GAS FROM AN INTERNAL COMBUSTION ENGINE AND MATERIAL THEREFOR

John W. Deline, 6100 E. Sixth Ave., Denver, Colo.

Filed July 23, 1971, Ser. No. 165,495
Int. Cl. B01d 53/34
U.S. Cl. 252—427 5 Claims

A method for reducing emission of pollutants in the exhaust gas from an internal combustion engine comprising removing

from said exhaust gases a portion of the hydrocarbons contained therein and reducing the amount of carbon monoxide gas contained therein by contacting said hydrocarbons and said carbon monoxide gas with a porous cellulosic material such as rice hulls and ground corn cobs thereby absorbing and adsorbing said hydrocarbons within and upon said rice hulls and using said absorbed and adsorbed hydrocarbons to oxidize the carbon monoxide gas. The process also includes removing from said exhaust gas a portion of those gases contributing to the production of photochemical smog and, also, reducing the amount of carbon monoxide gas by contacting said gases with a chemical activator selected from the group consisting of copper oxide, copper chloride, and compounds of the transitional elements thereby oxidizing said portion of said gases. The cellulosic material may be moistened and a portion thereof is preferably charred.

3,787,329

SILICON CONTAINING MOLYBDENUM CATALYSTS

Stanley Bruce Cavitt, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Dec. 28, 1970, Ser. No. 102,137

Int. Cl. C07d *1/08*

U.S. Cl. 252—431 R **7 Claims**

Stable, homogeneous silicon-containing molybdenum catalysts are prepared by incorporating silicon ligands into molybdenum compounds prepared by reacting an ammonia-containing molybdate with a hydroxy compound, for example, an organic primary or secondary alcohol, a glycol or a phenol. The hydrocarbon-soluble, silicon-containing molybdenum solutions are useful as homogeneous oxidation catalysts, particularly for the oxidation of olefins to olefin oxides. Olefin oxides are useful in the manufacture of non-toxic antifreeze urethanegrade polyols and many other applications. The silicon-containing molybdenum catalysts of the invention may also be used as metal plating solutions, lubricant additives, pigments, ammoxidation catalysts, printing inks, or solution components for organic laser devices. They may also be used as catalysts or co-catalysts for various polymerization processes, such as homopolymerization of isocyanates, isocyanate-polyol reactions, or olefin oxide polymerization reactions.

3,787,330

REFINING AGENT FOR OILY SUBSTANCES

Yujiro Sugahara, Tokyo; Kouichi Usui, Tsuruoka-shi; Hiroyuki Naito, Tsuruoka-shi, and Syoji Matuzawa, Tsuruoka-shi, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Higashi-ku, Osaka, Japan

Filed Sept. 26, 1969, Ser. No. 861,494

Claims priority, application Japan, Oct. 1, 1968, 43-70809; Aug. 14, 1969, 44-63837

Int. Cl. B01j *11/62*

U.S. Cl. 252—437 **3 Claims**

A refining agent for oily substances comprising granules or small aggregates of an acid-treated product of clay consisting predominantly of montmorillonite having a specific surface area of at least 120 square meters per gram and a pore volume of at least 0.7 milliliter per gram, said pore volume being defined by the equation:

$$n \times (1/d_1) / (1/d_2)$$

wherein d_1 is the apparent density of the small aggregates, d_2 is the true density of the acid-treated product of montmorillonitic clay, and n is the pore volume in milliliters per gram. Such granules or small aggregates are prepared by a process comprising intimately contacting a clay consisting predominantly of montmorillonite and containing acid-soluble basic constituents with an acid or aqueous solution thereof and forming a small aggregrate-like solid product therefrom; drying the product; extracting the basic constituents from the solid product; and thereafter recovering the small aggregates.

3,787,331

CATALYST BASED ON ALUMINUM FLUORIDE FOR THE FLUORINATION IN GASEOUS PHASE OF HYDROCARBONS

Giovanni Groppelli; Vittorio Fattore; Martino Vecchio, all of Milan, and Arsenio Castellan, Bollate, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Oct. 7, 1969, Ser. No. 864,519

Claims priority, application Italy, Oct. 10, 1968, 22295/68

Int. Cl. B01j *11/78*

U.S. Cl. 252—442 **1 Claim**

A catalyst is disclosed for the preparation of fluroinated or chlorofluorinated hydrocarbons through fluorination or chlorofluorination reactions in gaseous phase, the catalyst comprising aluminum fluoride or fluorinated alumina containing minor quantities of manganese, chromium and preferably also nickel compounds present in quantities corresponding to the following percentages by weight of metal based on the total: from 0.05 to 5% of Mn, from 0.1 to 5% of Cr, and up to 5% of Ni. The manganese, the chromium and (when present) the nickel are at least partially present in the form of halides, and in particular the fluorides, or as oxides or as oxy-halides.

3,787,332

CARBON MONOXIDE CONVERSION CATALYSTS

Andre Sugier, Ruel Malmaison, France, assignor to Institut Francas du Petrole, Des Carburants et Lubrifiants, Bois-Preau, France

Filed July 21, 1970, Ser. No. 56,974

Claims priority, application France, July 25, 1969, 69.25671

Int. Cl. B01j *11/22, 11/06, 11/22*

U.S. Cl. 252—443 **30 Claims**

This invention relates to a catalyst, to a process for the manufacture thereof and to a process for manufacturing hydrogen by reacting carbon monoxide with water at 150°–550°C in the presence of the above catalyst. This catalyst comprises an active phase consisting of the mixed oxides of (a) copper and (b) a trivalent metal selected from aluminum, chromium, manganese, iron and cobalt, at least 60% by weight of said mixed oxides having a spinel structure. The catalyst is manufactured by admixing the catalyst components in solution with a heat-decomposable complexing organic compound or with a heat-decomposable gel-forming compound, the solvent being evaporated thereafter and the mixture being finally roasted at a temperature of at least 200°C.

3,787,333

METHOD FOR THE PRODUCTION OF AN AUTOMOTIVE EXHAUST GAS CATALYST

Shoichi Ichihara, Ibaraki; Hauruichi Hara, Toyonaka, and Takashi Ohara, Nishinomiya, all of Japan, assignors to Nippon Shokubai Kogyo Co., Ltd., Higashi-ku, Osaka, Japan

Filed Nov. 16, 1971, Ser. No. 199,378

Int. Cl. B01j *11/06, 11/12*

U.S. Cl. 252—465 **26 Claims**

A method for preparing a catalyst suitable for use in a catalytic system for oxidation of air pollutants in automotive exhaust gases, such method comprising, in combination, the steps of mixing and kneading a nickel source and a chromium source, and, as a binder, a member selected from the group consisting of an alumina sol and a soluble aluminum hydroxide, and, as a carrier, activated alumina, molding the resulting mixture with a catalyst molder into a desired shape, drying the formed material, impregnating the dried formed material with a solution of a palladium salt, drying the thus impregnated formed material, and thereafter calcining same.

3,787,334

PROCESS FOR PREPARATION OF OXIDATION CATALYST

Keisho Yamada; Sumio Umemura; Kyoji Ohdan, all of Ube; Mikio Hidaka, Shimonoseki; Yasuo Bando, Ube; Kazuo Fukuda, Ube, and Masao Sawazi, Ube, all of Japan, assignors to UBE Industries, Ltd., Yamaguchi-ken, Japan

Filed Nov. 23, 1971, Ser. No. 201,391

Claims priority, application Japan, Dec. 1, 1970, 45-105441

Int. Cl. B01j *11/06, 11/32*

U.S. Cl. 252—468 7 Claims

A process for the preparation of an oxidation catalyst, consisting of molybdenum, bismuth, a group II metal of the periodic table and oxygen, which comprises in combination the steps of combining (a) a dispersion in which a member selected from the group consisting of the oxides of antimony and bismuth antimonate has been suspended, (b) a solution of a salt of a group II metal of the periodic table, (c) a solution of a member selected from molybdic acid and the salts thereof, and (d) a solution of a bismuth salt; adjusting the pH of the combined solution to a value of 1 – 8 to thereby cause the formation of a coprecipitate containing the four components of molybdenum, antimony, bismuth and group II metal; separating the resulting coprecipitate from the mother liquor; washing the coprecipitate; and thereafter calcining the washed coprecipitate at a temperature ranging from 400° and 800°C.

3,787,335

PRE-REDUCTION OF AMMONIA SYNTHESIS CATALYST USING HYDROGEN

Robert Murphy Yarrington, Old Greenwich, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 2, 1971, Ser. No. 149,348

Int. Cl. B01j *11/22*; C23c *11/12*; C21c *15/00*

U.S. Cl. 252—472 2 Claims

A process for reducing an iron oxide catalyst material useful in ammonia synthesis employing a gas consisting essentially of hydrogen and substantially no gaseous component which will react under the conditions of reduction, a temperature of at least 450°C. and a pressure of at least 45 psig.

3,787,336

ELECTRODES FOR ARC FURNACES

John David Sharp, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Filed Apr. 21, 1971, Ser. No. 136,188

Claims priority, application Great Britain, Apr. 21, 1970, 19041/70

Int. Cl. H01b *1/06*

U.S. Cl. 252—511 2 Claims

Lateral arcing in arc furnace may be reduced by using an electrode having a bonded carbonaceous core containing a nitrogen-generating material.

3,787,337

WHOLE PROTEIN SHAMPOO COMPOSITION

William D. Goodwin, Decatur, Ga., assignor to The Athlon Corporation, Atlanta, Ga.

Filed Oct. 22, 1971, Ser. No. 191,780

Int. Cl. C11d *1/20*

U.S. Cl. 252—545 11 Claims

A shampoo is prepared by incorporating into a shampoo base a whole protein composition obtained by solubilization of a keratin protein material particularly chicken feathers, and an alkanolamine, such as triethanolamine, or with N,N-dimethylformamide, and a surfactant.

ERRATA

For Classes 260—88.20 F thru 260—438.50 R see: Patents Nos. 3,787,323 thru 3,787,326

3,787,338

AQUEOUS DISPERSIONS OF FINELY DIVIDED LUBRICANTS IN POLYAMIDE ACID

David W. Skelly, Burnt Hills, and Bernard C. Wagner, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,591

Int. Cl. C08g *51/24*; C08j *1/48*; C23b *13/00*

U.S. Cl. 260—29.2 1 Claim

Substantially uniform aqueous dispersions are provided of a finely divided solid, such as a pigment or a lubricant, for example, polytetrafluoroethylene particles, in a polyamide acid. These aqueous polyamide acid dispersions can be employed to make polyimide-metal composites exhibting improved lubricity.

3,787,339

PROCESS FOR DEFOULING ANION EXCHANGE RESINS WITH CHLORINE DIOXIDE

Russell B. Hodgdon, Jr., Sudbury, and Edward T. Roach, Arlington, both of Mass., assignors to Ionics, Incorporated, Watertown, Mass.

Filed Sept. 7, 1972, Ser. No. 286,849

Int. Cl. B01d *15/06*; C02b *1/76*

U.S. Cl. 260—2.1 R 9 Claims

A process for treating fouled anion exchange resins with a stabilized chlorine dioxide solution for the purpose of regenerating the same for reuse. The process is especially useful for treating anion exchange membranes which have become fouled when employed in the electrodialysis of solutions containing large organic molecules.

3,787,340

SELF CROSSLINKING POWDER COATING COMPOSITIONS II

Santokh S. Labana, Dearborn Heights, and Yun Feng Chang, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 16, 1971, Ser. No. 172,237

Int. Cl. C08f *19/14*

U.S. Cl. 260—23 XA 7 Claims

Powder coating compositions are disclosed. In general, individual powder coating compositions of this invention are a mixture of several materials. The most significant materials employed in the powder coatings include the following. A copolymer containing hydroxy and carboxy crosslinkable, functional groups, forms the most important constituent of the powder coating. This copolymer has a glass transition temperature in the range of 40°to 90°C and a molecular weight ($\overline{M}_n$) in the range from about 2,000 to about 15,000. Another material of an individual composition is a flow control agent which forms at least 0.05% by weight of the mixture. The flow control agent is a polymer having a molecular weight ($\overline{M}_n$) of at least 1,000. Also, the flow control agent has a glass transition temperature at least 50°C lower than the glass transition temperature of the copolymer. Other materials which may be employed in individual powder coating compositions are catalysts, pigments, antistatic agents and plasticizers.

3,787,341

NOVEL PROCESSING AIDS FOR NATURAL AND SYNTHETIC RUBBER COMPOUNDS

Erwin Aron, Clifton, N.J., assignor to Technical Processing, Inc., Paterson, N.J.

Filed June 12, 1972, Ser. No. 263,752

Int. Cl. C08d *7/18*

U.S. Cl. 260—23.7 M 10 Claims

This invention is directed to novel compositions which aid in the processing of natural and synthetic rubber by permitting

the usual peptizing step of such processing to be omitted These compositions contain salts of aromatic sulfonic acids as well as long chain (fatty) acids as essential ingredients.

3,787,342

HOT-MELT ADHESIVE COMPOSITION CONTAINING GLYCEROL ESTER OF FUMARIC-MODIFIED ROSIN

David A. Berry; Albert R. Bunk, both of Columbus, Ohio; Noah J. Halbrook, Walter H. Schuller, and Ray V. Lawrence, all of Lake City, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 27, 1970, Ser. No. 15,233

Int. Cl. C08c *9/18*; **C08d** *3/40*

U.S. Cl. 260—24 **6 Claims**

Hot-melt adhesive composition consisting essentially of a substantially linear polyamide resin, having an average molecular weight between 3,000 and 10,000 and a Ball and Ring softening point between 45° and 190° C, and between 5 and 30 parts by weight of glycerol ester of fumaric-modified rosin for each 100 parts by weight of the linear polyamide resin; with a preferred composition containing between 10 and 20 phr of the glycerol ester of fumaric-modified rosin and up to 10 phr of a petroleum-derived wax selected from the group of paraffin and microcrystalline waxes.

3,787,343

TREATMENT OF COAL EXTRACTS

Joseph Gordon Robinson, Winchcombe, and William Sydney Durham Wise, Tewkesbury, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Mar. 11, 1971, Ser. No. 123,423

Claims priority, application Great Britain, Mar. 17, 1970, 12755/70

Int. Cl. C08g *51/52*

U.S. Cl. 260—28 **8 Claims**

Phenolic compositions which may be reacted with aldehyde or aldehyde donors, e.g., formaldehyde or hexamine, to form resinous or resinifiable compositions may be manufactured by reacting a solution or extract of coal with a phenol.

3,787,344

HIGH BUFFING VINYL AROMATIC RESIN-WOOD COMPOSITES

Duane L. Kenaga, and Richard H. Hall, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 2, 1970, Ser. No. 94,621

Int. Cl. C08f *45/28, 45/52*; **B28k** *3/50*

U.S. Cl. 260—28.5 A **5 Claims**

A wood product having a self-polishing, lubricated, water-resistant surface and a method for accomplishing the same which method comprises impregnating wood with a solution of a vinyl aromatic monomer, a low melting wax, a cross-linking agent such as a dimethacrylate or diacrylate of a glycol or a polyglycol, divinylbenzene, dimethacrylate or a polyester of maleic anhydride with or without a catalyst, the impregnation being conducted after evacuation of the wood, the cure being accomplished by heating the wood to between about 80° and 150°C. for from 10 to 60 minutes.

3,787,345

STICK FOR THE APPLICATION OF ADHESIVE TO SUBSTRATES

Heinz Hermann Dickman, Buehl/Baden; Richard Krattner, Neusatz/Baden, both of Germany, and Hans-Dieter Mobius, deceased, late of Buehl/Baden, Germany (by Isolde Mobius nee Diehnelt, executor), assignors to UHU-Werk H.u.M. Fischer G.m.b.H., Buehl/Baden, Germany

Filed Oct. 26, 1971, Ser. No. 192,340

Claims priority, application Germany, Nov. 5, 1970, 2054503

Int. Cl. C08f *45/36*; **C08q** *51/36*

U.S. Cl. 260—28.5 R **6 Claims**

Gluestick adhesive compositions for adhesively securing together two substrates comprise a solution or dispersion of an adhesive of N-vinyl-pyrrolidone polymer or co-polymer and wax acids, or esters of such acids with alcohols having one to eight carbon atoms, in sufficient amount for the composition to be moulded in stick form as a self-supporting gel.

3,787,346

STICK FOR THE APPLICATION OF ADHESIVE TO SUBSTRATES

Heinz Hermann Dickmann, Buhl/Baden, and Richard Krattner, Neusatz/Baden, both of Germany, assignors to UHU-Werk H.u.M. Fischer G.M.b.H., Buhl/Baden, Germany

Filed Apr. 17, 1972, Ser. No. 244,950

Claims priority, application Great Britain, Apr. 23, 1971, 11214/71; July 9, 1971, 32246/71

Int. Cl. C08f *45/36*; **C08g** *51/36*

U.S. Cl. 260—28.5 R **5 Claims**

Adhesive glue sticks are formed from an adhesive dissolved or dispersed in a solvent containing an anionic non-soap surfactant and mixed with aliphatic carboxylic acids having 24 – 50 carbon atoms, and/or esters thereof with alcohols having 1 – 8 carbon atoms, as structuring substance.

3,787,347

NOVEL RESINOUS COMPOSITIONS AND METHOD FOR PRODUCING SAME

Leo X. Mallavarapu, Suffern, N.Y., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Feb. 18, 1972, Ser. No. 227,656

Int. Cl. C08g *51/26, 51/34, 51/30*

U.S. Cl. 260—30.4 EP **4 Claims**

This invention relates to certain novel curable resinous compositions of matter comprising (A) an organic polyepoxide having a molecular weight ranging from about 1000–2000 and (B) a primary or secondary amine containing hydroxyl groups and a method for producing the same. These resinous compositions of matter may be cured into useful protective coatings at low ambient temperatures through the use of polyisocyanates as curing agents.

3,787,348

N,N-DIMETHYLACETAMIDE SOLUTIONS OF POLYHYDRAZIDES

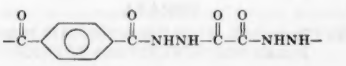
Frank Dobinson, Gulf Breeze, and Chris A. Pelezo, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 20, 1972, Ser. No. 290,597

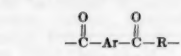
Int. Cl. C08g *51/44*

U.S. Cl. 260—32.6 NA **11 Claims**

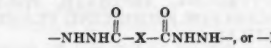
Stable, N,N-dimethylacetamide/lithium chloride spinning solutions comprised of a high-molecular weight polymer consisting essentially of recurring structural units of which at least 90 mol percent are of the formula



and 10 mol percent or less are of the structure



where R is



each Ar and Ar' is a divalent aromatic radical, the chain-extending covalent bonds of which are oriented meta or para to one another, and X is a covalent bond or a said divalent aromatic radical with the proviso that when Ar is a para-phenylene radical X is a said divalent aromatic radical. These solutions are useful for making shaped articles such as fibers and films having excellent tensile properties.

3,787,349
COLD-SETTING ROAD-MARKING MATERIAL
Arne Lennart Eliasson, Hassleholm, Sweden, assignor to Svenska AB Cleansol, Kristianstad, Sweden
No Drawing. Filed Feb. 9, 1972, Ser. No. 224,931
Claims priority, application Sweden, Feb. 10, 1971, 1,629/71
Int. Cl. C08g *51/04*
U.S. Cl. 260—37 EP **9 Claims**

A cold-setting, sprayable and extrudable road-marking material consisting of binder, pigment, filler and aggregate, said binder being constituted by a curable epoxy resin, hardener and, if desired, accelerator and plasticizer.

3,787,350
PHENOL-ARALKYL ETHER RESINS
Glyn Islwyn Harris, Stourbridge, and Alfred Gerald Edwards, Stourport-on-Severn, England, assignors to Albright & Wilson Limited, Oldbury, Warwickshire, England
No Drawing. Filed Jan. 19, 1972, Ser. No. 219,160
Claims priority, application England, Jan. 21, 1971, 2,907/71
Int. Cl. C08g *5/06, 23/00, 37/06*
U.S. Cl. 260—38 **7 Claims**

Polymeric materials are known to be made by reacting together a phenolic material and an aralkyl ether of the general formula $R'[—(CH_2OR)]_a$ where R' is an aromatic hydrocarbon or hydrocarbon ether radical and *a* is 2 or 3.

The cold flow properties of the polymers can be improved if their production is carried out using a copper, mercuric, mercurous or silver salt or a sodium hydrogen sulphate as catalyst.

Polymers made by this method are particularly suitable for use in moulding compounds or coating materials for application by fluidized bed techniques.

3,787,351
USE OF SOLUBLE FLUOROALIPHATIC OLIGOMERS IN RESIN COMPOSITE ARTICLES
Maynard H. Olson, St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Feb. 28, 1972, Ser. No. 230,063
Int. Cl. C08g *51/10;* **C08f** *45/10*
U.S. Cl. 260—40 R **18 Claims**

Mechanical properties of shaped articles of self-supporting structural filled or reinforced resin composites, such as glass fiber reinforced polyesters or epoxy resin composites, are improved by incorporating in the composite soluble fluoroaliphatic radical-containing oligomers.

3,787,352
METHOD OF PREPARING GLASS FIBER-ELASTOMER COMPOSITIONS
Alfred Marzocchi and John C. Martineau, Cumberland, R.I., assignors to Owens-Corning Fiberglas Corporation
Filed Sept. 2, 1971, Ser. No. 177,237
Int. Cl. C08f *45/04*
U.S. Cl. 260—41 AG **5 Claims**

This invention is addressed to a method for the preparation of molding compounds formed of an elastomeric material reinforced with glass fibers wherein bundles of glass fibers which have been impregnated with an elastomer component are chopped to shorter lengths and then combined with elastomeric material while working the elastomeric material to separate the fibers forming the bundle each from the other and to uniformly distribute the fibers throughout the elastomeric material. The molded compositions of the present invention are characterized by significantly improved hysteresis characteristics when subjected to deformation under stress.

3,787,353
STABILIZED POLYOXYMETHYLENE COMPOSITIONS
Takami Ishii, Ichihara, Toshio Yoshikawa, Chiba, and Toshihiro Inaike, Kazuhiro Kuroda, Kunio Kido, and Kiyoaki Tokunaga, Ichihara, Japan, assignors to Ube Industries, Ltd., Ube-shi, Yamaguchi-ken, Japan
No Drawing. Filed June 1, 1971, Ser. No. 148,978
Claims priority, application Japan, June 2, 1970, 45/46,926
Int. Cl. C08g *51/58, 51/60*
U.S. Cl. 260—45.9 P **18 Claims**

A stabilized polyoxymethylene composition which comprises polyoxymethylene and 0.01 to 10% by weight to the polyoxymethylene of a compound of the formula,

$$R\{NHCOOH_2X)_n$$

in which

R is a hydrocarbon group of 2 to 20 carbons, or a hydrocarbon group of 2 to 40 carbons containing oxygen or sulfur as an intermediary atom,
X is cyano or carbamoyl group, and
n is an integer of 2 to 6.

3,787,354
STABILIZATION OF SOLID POLYMERS WITH A BIS-(N,N-DIHYDROCARBYL-AMINOALKYL) ETHER
Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Original application July 15, 1970, Ser. No. 55,262, now abandoned. Divided and this application Feb. 16, 1972, Ser. No. 226,979
Int. Cl. C08g *51/60*
U.S. Cl. 260—45.9 R **10 Claims**

Stabilization of organic substances against deterioration due to UV light, oxidation, heat, etc., by incorporating therein a bis-(N,N-dihydrocarbyl-amino-alkyl) ether in which the hydrocarbyl is sec-alkyl of from 3 to about 20 carbon atoms or cycloalkyl having 4 to about 12 carbon atoms in the ring. In one embodiment the compounds are used as weathering stabilizers for plastics.

3,787,355
STABILIZING OF POLYAMIDES
Helmut Linhart, Reinach, and Helmut Mueller, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
No Drawing. Filed Nov. 30, 1971, Ser. No. 203,467
Claims priority, application Switzerland, Dec. 7, 1970, 18,131/70
Int. Cl. C08g *51/58, 51/60, 51/62*
U.S. Cl. 260—45.75 R **16 Claims**

Disclosed are stabilizing systems comprising (a) a phenolic antioxidant, (b) a derivative of phosphorus and (c)

a salt of divalent manganese with inorganic or organic acids.

Polyamide stabilized therewith are less yellowed under thermofixing conditions and they show a good light resistance and excellent long term protection against loss of tensile properties.

3,787,356

FIRE RETARDANT COMPOSITIONS

Jerome A. Gourse, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Filed May 8, 1972, Ser. No. 251,722
Int. Cl. C08f *45/62*
U.S. Cl. 260—45.75 B **6 Claims**

This invention discloses new fire retardant polymeric compositions which comprise a combustible polymer and the compound 1,2-dibromo-4,5,6,7,8,8-hexachloro-3a,4,7,7a-tetrahydro-4,7-methanoindane.

3,787,357

SYNERGISTIC MERCAPTO ORGANOTIN STABILIZERS

Lawrence Robert Brecker, Brooklyn, N.Y., assignor to Argus Chemical Corporation, Brooklyn, N.Y.

No Drawing. Filed Sept. 7, 1972, Ser. No. 287,118
Int. Cl. C08f *45/62*
U.S. Cl. 260—45.75 K **29 Claims**

A synergistic stabilizer composition which is liquid at ambient temperature is provided for increasing resistance to early discoloration of polyvinyl chloride resins heated to 400° F. and for improving their processability comprising: (1) at least one monoalkyltin mercaptocarboxylic acid ester having tetravalent tin linked directly to carbon and to sulfur, (2) at least one dialkyltin compound, having tetravalent tin linked directly to carbon and to sulfur, for example, organotin sulfide, a mercaptocarboxylic acid ester or an ester sulfide, (3) barium carbonate and (4) an organic salt acting as a liquifier for the barium carbonate.

3,787,358

PROCESS FOR PRODUCING POLYPHENYLENE OXIDES

Akinori Nishioka and Shigeo Kawatani, Yokohama, and Mitsuo Ichikawa, Tokyo, Japan, assignors to Japan Synthetic Rubber Company Limited, Tokyo, Japan

No Drawing. Filed Nov. 5, 1971, Ser. No. 196,187
Claims priority, application Japan, Nov. 12, 1970, 45/99,668
Int. Cl. C08g *23/18*
U.S. Cl. 260—47 ET **5 Claims**

A process for producing polyphenylene oxides which comprises reacting a 2,6-disubstituted phenol with oxygen in the presence of cupric sulfide, an amine, and a metallic salt, other than a cuprous salt, which is soluble in said amine.

3,787,359

CONTINUOUS MANUFACTURE OF HIGH MOLECULAR WEIGHT LINEAR POLYCARBONATES

Peter Horn and Ludwig Schuster, Ludwigshafen, Georg Falkenstein, Neustadt, and Hans-Ingo Joschek, Mannheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 11, 1972, Ser. No. 216,949
Claims priority, application Germany, Jan. 15, 1971, P 21 01 700.5
Int. Cl. C08g *17/13*
U.S. Cl. 260—47 XA **9 Claims**

Continuous manufacture of high molecular weight linear polycarbonates of high purity from organic dihydroxy compounds and phosgene in one or more packed reactors, wherein the reaction is carried out under "transition flow" conditions, conveniently with recycling of the reaction mixture.

3,787,360

PHOSPHORUS CONTAINING AROMATIC POLYMERS AND PROCESS FOR PRODUCING FLAME-RESISTANT TEXTILES

Donald J. Daigle, New Orleans, and George L. Drake, Jr., and Wilson A. Reeves, Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Original application May 7, 1971, Ser. No. 141,356. Divided and this application Mar. 28, 1972, Ser. No. 238,929
Int. Cl. C08g *33/16*
U.S. Cl. 260—47 P **2 Claims**

Soluble methylol phosphine adducts are prepared by reacting tris(hydroxymethyl)phosphine with substituted or unsubstituted phenol which contains one or more hydrogens ortho or para to the phenolic hydroxyl group. These adducts are convenient and useful for (a) the preparation of flame resistant polymers and (b) the preparation of flame- and glow-resistant organic fibrous materials and flame-, glow-, wrinkle-, and shrink-resistant woven and knit textiles which contain about 25% or more cellulosic fibers.

3,787,361

PROCESS FOR PRODUCTION OF POLYPHENYLENE OXIDE COMPOUNDS

Seizo Nakashio, Nishinomiya, Toshio Takemura, Kyoto, and Takashi Maruyama, Kunio Ota, and Tetsuki Seto, Takatsuki, Japan, assignors to Sumitomo Chemical, Limited, Osaka, Japan

No Drawing. Continuation of abandoned application Ser. No. 97,372, Dec. 11, 1970. This application July 7, 1972, Ser. No. 269,551
Claims priority, application Japan, Dec. 16, 1969, 44/101,434
Int. Cl. C08g *23/18*
U.S. Cl. 260—47 ET **23 Claims**

A process is provided in which polyphenylene oxide polymers are readily prepared in high yields by oxidative polymerization of phenols with oxygen in the presense of a novel ternary catalyst system composed of a manganese compound, a primary amine, and an alcohol. Compared with polymers obtained with known catalysts, the present polymer has narrower molecular weight distribution and is thermally more stable and more resistant to oxidation so that no special stabilizing treatment is necessary. The polymer shows improvement in creep resistance, dimensional stability, environmental stress cracking, etc.

3,787,362

PREPARATION OF POLYPHENYLENE ETHERS WITH DIALKYLFORMAMIDE PROMOTED COPPER-AMINE CATALYSTS

James G. Bennett, Menands, and Arthur Katchman, Delmar, N.Y., assignors to General Electric Company

No Drawing. Original application Apr. 30, 1971, Ser. No. 139,216, now Patent No. 3,730,944. Divided and this application Feb. 14, 1973, Ser. No. 332,384
Int. Cl. C08g *23/18*
U.S. Cl. 260—47 ET **13 Claims**

Process for the preparation of high molecular weight polyphenylene ethers by oxidatively coupling a di-ortho-substituted phenolic precursor in a reaction system containing oxygen and a complex catalyst formed from a copper salt and either a primary, secondary or tertiary amine and an alkylene carbonate or a dialkyl sulfoxide promotor or a primary or tertiary amine and a dialkyl formamide promoter. Use of the promotors results in the formation of higher molecular weight polymer in a given reaction time or polymer of comparable molecular weight in substantially decreased reaction time.

3,787,363
AROMATIC POLY SULFONES

Philip Anthony Staniland, Welwyn Garden City, and Graham Jarrett, Hitchin, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Dec. 14, 1971, Ser. No. 207,958
Int. Cl. C08g *49/00, 49/04*
U.S. Cl. 260—49 **5 Claims**

Aromatic polymeric materials of increased molecular weight are obtained by heating at temperatures between 300° C. and 450° C. a mixture comprising 95 to 99.99% by weight of at least one thermoplastic aromatic polysulphone containing repeat units —Ar—SO_2— (where Ar is a bivalent aromatic residue which may vary from unit to unit in the polymer chain and at least some of the Ar units have an aromatic ether group in the polymer chain ortho or para to at least one —SO_2— group) and 5 to 0.01% by weight of sulphur present as elemental sulphur, sulphide or disulphide in at least one compound selected from the class consisting of elemental sulphur, aliphatic and aromatic dithiols, and aliphatic and aromatic polydisulphides.

3,787,364
PROCESS FOR MAKING POLYETHERIMIDES

Joseph G. Wirth and Darrell R. Heath, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed Sept. 1, 1971, Ser. No. 177,165
Int. Cl. C08g *20/32, 23/00*
U.S. Cl. 260—61 **13 Claims**

Polyetherimides are prepared from the reaction of a bis(chlorophthalimide) with an alkali metal salt of a divalent carbocyclic aromatic radical in the presence of an appropriate solvent.

3,787,365
PROCESS FOR THE BULK POLYMERIZATION OF ACRYLONITRILE

Paolo Melacini, Luigi Patron, Alberto Moretti, and Raffaele Tedesco, Mestre, Venice, Italy, assignors to Montefibre S.p.A., Milan, Italy

No Drawing. Filed Apr. 23, 1971, Ser. No. 136,901
Claims priority, application Italy, Apr. 28, 1970, 23,963/70
Int. Cl. C08f *3/76, 15/22*
U.S. Cl. 260—63 N **8 Claims**

Free-radical bulk polymerization of acrylonitrile with or without another copolymerizable ethylenically unsaturated monomer, using a free-radical catalytic system having a decomposition rate constant (K_d) greater than 1 $hr.^{-1}$ at the polymerization temperature, a reaction time (Q) sufficient to semi-decompose the catalyst, and a catalyst concentration $(C)_o$ equal to or greater than 2.10^{-3} Q moles/liter, wherein "Q" is the residence time expressed in hours.

3,787,366
REACTIVE BETA-LACTONE-CONTAINING POLYMERS AND A METHOD FOR THEIR PREPARATION

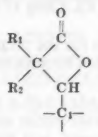
Walter L. Vaughn, Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 11,362, Feb. 9, 1970. This application Feb. 10, 1972, Ser. No. 225,299
Int. Cl. C08g *15/00*
U.S. Cl. 260—64 **10 Claims**

Polyalkylene copolymers containing pendant beta-lactone groups are prepared by treating a polyalkylene copolymer, containing at least one pendant aldehyde group of the formula

with a ketene of the formula

to form one or more pendant beta-lactone groups of the formula



wherein C_1 is a carbon atom in the polyalkylene molecule and R_1 and R_2 are H, alkyl, aryl, aralkyl, alkaryl and the like. The resulting beta-lactone groups are easily crosslinked to form insoluble films and coatings.

3,787,367
SOLUBLE COPOLYIMIDES

William J. Farrissey, Jr., Northford, and Philip S. Andrews, Hamden, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Nov. 29, 1972, Ser. No. 310,398
Int. Cl. C08g *20/32*
U.S. Cl. 260—65 **7 Claims**

Copolyimides are prepared from pyromellitic dianhydride (PMDA) or mixtures of pyromellitic dianhydride with 3,3',4,4'-benzophenone tetracarboxylic acid dianhydride (BTDA), and mixtures of 4,4'-methylenebis (phenyl isocyanate) (MDI) and toluene diisocyanate (TDI) (2,4-, or 2,6-isomer or mixtures thereof). The mixture of anhydrides is used in a molar percent ratio of PMDA to BTDA of 100 to 75/25 respectively. The mixture of isocyanates is used in a molar percent ratio from about 10/90 to 35/65 of MDI to TDI respectively. The copolyimides of the invention are soluble in their organic reaction solvents but retain their high thermal stability. The solubility allows for the facile preparation of films, laminates, coatings, fibers, and the like. The improvement in heat stability over previously known polyimides is achieved without any loss in solubility properties. The copolyimides can be used in the preparation of high temperature resistant polymer articles and in the various applications for which polyimides are known to be especially adapted.

3,787,368
PROCESS FOR PREPARING A POLYMER COMPRISING REACTING A METAL HALIDE WITH AN AMIDE FOLLOWED BY CONDENSATION WITH AN ALDEHYDE, SAID METAL BEING ZIRCONIUM, HAFNIUM OR TITANIUM

Harry L. Lander, Trenton, N.J., assignor to Poly-Chem Industries, Inc., Saddle Brook, N.J.

No Drawing. Continuation-in-part of application Ser. No. 100,805, Dec. 22, 1970, which is a continuation-in-part of application Ser. No. 9,076, Feb. 5, 1970, both now abandoned. This application Aug. 4, 1971, Ser. No. 169,092
Int. Cl. C08g *9/10, 9/12, 9/30*
U.S. Cl. 260—67.6 R **14 Claims**

Polymeric materials are prepared by polymerizing an organic compound containing at least two labile hydrogens in the presence of a zirconium, hafnium or titanium halide. The labile hydrogen atoms are provided by amides, including aminoplasts, carboxylic acids, polyhydroxy compounds or other compounds capable of forming reactive complexes with zirconium, hafnium and titanium halides. Aqueous media can be employed.

3,787,369

PROCESS FOR PREPARING FIRE RETARDANT POLYESTERS

Walter M. Zimberg, Tonawanda, Arthur C. Schulz, North Tonawanda, and George C. Woehr, Buffalo, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Sept. 20, 1971, Ser. No. 182,178

Int. Cl. C08g *17/12*

U.S. Cl. 260—75 H 15 Claims

An improved process for the preparation of unsaturated polyesters is provided. The process comprises the steps of:

(a) Forming a 1:1 adduct of a polyhalogenated cyclopentadiene and a polycarboxylic acid anhydride in which the latter is used in excess, and preferably the former is employed in a highly purified form, the adduction reaction being carried out in an atmosphere of an oxygen containing gas and preferably at relatively low temperature within the range of about 110 to about 145 degrees centigrade;

(b) Reacting the adduct mixture from step (a) with a polyol or polyol forming material, e.g., an alkylene oxide, preferably in the presence of phosphoric acid to catalyze the esterification reaction;

(c) Interrupting the reaction of Step (b) after the formation of the half ester but before the acid number of the reaction mixture is decreased to about 40, and distilling the mixture with steam until substantially all of the steam volatile components have been removed; and

(d) Continuing the esterification of the adduct and polyol until an unsaturated polyester product having an acid number below about 40 is obtained, said

(e) Unsaturated polyester having a light color, low corrosivity to mild steel and which is copolymerizable with ethylene monomers to form light colored infusible fire retardant polymers.

3,787,370

PROCESS FOR THE PREPARATION OF SUBSTANTIALLY LINEAR POLYESTERS OF LOW FREE CARBOXYL GROUP CONTENT

Takeo Shima, Takanori Urasaki, and Isao Oka, Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed Mar. 14, 1972, Ser. No. 234,643

Int. Cl. C08g *17/015*

U.S. Cl. 260—75 R 16 Claims

A process for the preparation of substantially linear, fiber-forming or film-forming polyesters from a dicarboxylic acid or its ester-forming derivative, or a hydroxycarboxylic acid or its ester-forming derivative, and a glycol or its ester-forming derivative, such process being characterized by addition of at least one specific orthocarbonate at a certain stage of the polycondensation reaction to thereby form polyesters having a low free carboxyl group content.

3,787,371

CRYSTAL-CLEAR POLYAMIDES PREPARED BY CONDENSING BIS(AMINOMETHYL)-TRICYCLODECANE WITH AROMATIC DICARBOXYLIC ACIDS

Ludwig Brinkmann and Walter Herwig, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Dec. 8, 1971, Ser. No. 206,137

Claims priority, application Germany, Dec. 10, 1970, P 20 60 703.8

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 R 6 Claims

There are disclosed and claimed novel polyamides, which are obtained by polycondensating (a) bis-(aminomethyl)-tricyclodecanes and, optionally, aliphatic diamines, cycloaliphatic diamines or araliphatic diamines, (b) aliphatic saturated or aromatic dicarboxylic acids, and, optionally, (c) aliphatic amino-carboxylic acids, and the process for making the same.

3,787,372

PROCESS FOR THE PREPARATION OF AROMATIC COPOLYAMIDE-PHOSPHONAMIDES

Erich Blocker, Weilbach, and Peter Eckardt, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Dec. 16, 1971, Ser. No. 208,932

Claims priority, application Germany, Dec. 19, 1970, P 20 62 774.1

Int. Cl. C08g *20/34*

U.S. Cl. 260—78 R 12 Claims

New film- and fiber-forming high molecular weight aromatic copolyamide-phosphonamides are obtained by adding a phosphonic acid dihalide at elevated temperature to a melt of at least one aromatic diamine in excess, by dissolving the reaction product, after complete reaction, in a solvent of the amide kind, by adding at least one aromatic dicarboxylic acid halide to this solution at a temperature of from about −20° to +30° C., and thus polycondensing it to form a high molecular weight aromatic copolyamide-phosphonamide. Shaped articles made from these copolyamide-phosphonamides are distinguished by their good affinity to dyestuffs and poor flammability.

3,787,373

TERPOLYAMIDES WITH HEXAMETHYLENE TEREPHTHALAMIDE, HEXAMETHYLENE ISOPHTHALAMIDE AND CAPROAMIDE UNITS

James S. Ridgway and Oscar A. Pickett, Jr., Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 535,338, Mar. 18, 1966. This application Aug. 6, 1968, Ser. No. 750,490

Int. Cl. C08g *20/04, 20/12*

U.S. Cl. 260—78 A 3 Claims

Fiber-forming terpolyamides consisting of hexamethylene terephthalamide units, hexamethylene isophthalamide units and caproamide units. The properties of fibers formed from these terpolymers may be controlled by varying the mole proportion of the components from which they are prepared. The terpolymers are particularly useful in forming textile fibers and transparent films and castings.

3,787,374

PROCESS FOR PREPARING HIGH MOLECULAR WEIGHT CARBOXYLIC COMPOSITIONS

Charles Wesley Adams, Painesville, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 30,991, Apr. 22, 1970. This application Sept. 7, 1971, Ser. No. 178,503

Int. Cl. C08f *27/00*

U.S. Cl. 260—78.4 D 34 Claims

This invention relates to a process and the products obtained therefrom for preparing a high molecular weight

substantially saturated, hydrocarbon-substituted carboxylic composition and more specifically to an oil soluble carboxylic composition obtained by reacting at least one halogenated substantially-saturated hydrocarbon having at least 25 aliphatic carbon atoms per molecule with an effective amount of at least one low molecular weight, alpha or beta halogenated saturated-aliphatic carboxylic acid or a derivative thereof. The carboxylic compositions of this invention are particularly useful as additives, e.g., dispersants, etc. in various oleaginous materials including, for example, lubricating oils, hydraulic fluids, fuels, etc.

3,787,375

HIGH MOLECULAR WEIGHT, HIGH MELTING, LINEAR POLYAMIDES PREPARED FROM TRANS,TRANS-4,4'-DIAMINOBICYCLOHEXYL

Ronald Gene Blecke, Shawnee Mission, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Oct. 13, 1971, Ser. No. 189,035

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 R **5 Claims**

Fiber and film forming linear polyamides having unusually high melting points are prepared by effecting polymerization of the salt formed between an equimolar mixture of trans,trans-4,4'-diaminobicyclohexyl and an alpha, omega aliphatic dicarboxylic acid containing up to 12 carbon atoms. The polyamide prepared from trans, trans - 4,4' - diaminobicyclohexyl and dodecanedioic acid has a softening point of 360 to 380° C.

3,787,376

PROCESS FOR VULCANIZING POLYEPIHALOHYDRIN RUBBERS

Yoshiro Nakamura, Iwate, and Rikio Nagatomi, Tokyo, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

No Drawing. Filed Jan. 3, 1972, Ser. No. 215,106

Claims priority, application Japan, Dec. 31, 1970, 46/123,524, 46/123,525

Int. Cl. C08g *23/00*

U.S. Cl. 260—79 **17 Claims**

New process for vulcanizing polyepihalohydrin rubbers by heating in the presence of trithiocyanuric acid and/or its derivative such as sodium trithiocyanurate. The vulcanized product has excellent aging stability, especially good strength at break after aging. Vulcanized polyepihalohydrin rubbers concurrently having enhanced oxidation-preventing properties can be obtained by performing the vulcanization in the co-presence of a 2-mercaptoimidazoline such as 2-mercaptoimidazoline, or a carbamate of a polyamine such as hexamethylenediamine carbamate.

3,787,377

CONTINUOUS PROCESS OF COPOLYMERIZING BUTADIENE AND STYRENE

Adel F. Halasa, Bath, and Arthur E. Oberster, North Canton, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Dec. 16, 1971, Ser. No. 208,876

Int. Cl. C08f *19/08*

U.S. Cl. 260—83.7 **3 Claims**

Butadiene and styrene was copolymerized in a solution which is kept intact as it is passed through reactor means in a continuous process, using butyllithium as the initiator, with sodium or potassium t-amylate or mentholate as a modifier to produce a constant-composition copolymer rubber. A gel suppressant is used in the polymerization. The microstructure of the polybutadiene in the copolymer is not greatly different from that of the copolymer produced by butyllithium alone.

3,787,378

OPTICAL CONTACT LENSES AND RELATED DEVICES

Izhak Blank, Haifa, Israel, assignor to Hydrophilics International, Inc., New York, N.Y.

Application May 3, 1971, Ser. No. 139,545, which is a continuation-in-part of abandoned application Ser. No. 36,931, May 13, 1970. Divided and this application Jan. 24, 1973, Ser. No. 326,180

Int. Cl. C08f *15/14, 15/18*

U.S. Cl. 260—86.1 R **9 Claims**

A copolymer having hydrophilic surfaces is formed through the bulk copolymerization of methyl methacrylate and acrylic acid, in particular ranges, followed by a treatment of the formed copolymer with a mild, basic material, such as ammonium hydroxide, in order to neutralize the acid groups present. The depth of penetration of the basic material determines the degree to which the material is hydrophilic. A therapeutic agent may be incorporated into the copolymer after treatment.

3,787,379

COPOLYMERS OF VINYL FLUORIDE AND HEXAFLUOROPROPENE

Richard Anthony Ferren, Ambler, and Daniel Ashton Dimmig, King of Prussia, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed Oct. 5, 1971, Ser. No. 186,806

Int. Cl. C08f *15/06*

U.S. Cl. 260—87.5 A **6 Claims**

High molecular weight, heat stable, easily processable copolymers of vinyl fluoride and hexafluoropropene containing from 2 to 10 mole percent of polymerized units of hexafluoropropene are prepared by polymerizing the comonomers at pressures below 7000 p.s.i. in a reaction medium comprised of perfluoroalkane or perfluorochloroalkane solvent, or a mixture thereof with water, containing an effective amount of polymerization initiator having a ten-hour half life at a temperature between 0 and 50 C., within which range the polymerization is carried out.

3,787,380

POLYMERS OF N-VINYL OR N-ALLYL HETEROCYCLIC COMPOUNDS WITH MONOETHYLENICALLY UNSATURATED ESTERS AND GLYCIDYL ESTERS

Paul Stamberger, Baltimore, Md., assignor to Union Optics Corporation, Verona, Pa.

No Drawing. Filed Oct. 5, 1971, Ser. No. 187,131

Int. Cl. C08f *17/00, 19/00*

U.S. Cl. 260—80.72 **22 Claims**

Water insoluble but water swellable polymer comprising certain N-vinyl or N-allyl heterocyclic compounds; an unsaturated ester; and glycidyl methacrylate, and/or glycidyl acrylate and/or glycidyl crotonate. The polymer

may be swelled in aqueous solutions to provide a transparent hydrogel having excellent physical and optical properties, and suitable in an ophthalmic lens.

3,787,381

PROCESS FOR THE POLYMERIZATION WITH RING OPENING OF CYCLOPENTENE

Wolfgang Oberkirch, Cologne-Stammheim, Peter Gunther, Opladen, and Gottfried Pampus, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of abandoned application Ser. No. 877,007, Nov. 14, 1969. This application Aug. 4, 1971, Ser. No. 169,123

Int. Cl. C08f *1/56*

U.S. Cl. 260—87.5 C **5 Claims**

Catalyst combination for polymerizing cyclopentene comprising

(a) a compound of a metal of the 5th or 6th Group of the Periodic System,
(b) an organic aluminum compound,
(c) an aliphatic or aromatic hydrocarbon which contains one or more carbon-carbon double bonds and which is substituted

with halogen or at least one carbon atom of a double bond, and a polymerization process using this catalyst.

3,787,382

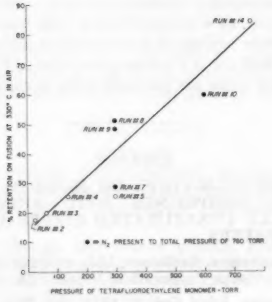
PHOTOPOLYMERIZATION OF TETRAFLUOROETHYLENE AND POLYMER AND PRODUCTS PRODUCED THEREFROM

Archibald N. Wright, Schenectady, N.Y., William R. Burgess, Woburn, Mass., and Edward V. Wilkus, Monroe, Conn., assignors to General Electric Company

Continuation of abandoned application Ser. No. 3,724, Jan. 19, 1970. This application Feb. 16, 1972, Ser. No. 226,947

Int. Cl. C08d *1/00*; C08f *3/24*

U.S. Cl. 260—92.1 R **2 Claims**



A process for producing novel white powdery tetrafluoroethylene polymer by irradiating tetrafluoroethylene monomer vapor at a temperature ranging from about 0° to about 200° C. and at a pressure of about 10 torr to 760 torr with ultraviolet light having a wave length in the range of about 1800 to 2400 angstroms. This polymer can be fused, generally at temperatures of about 350° C. and lower, to form coatings, particularly water-clear coatings, self-supporting films and other shaped products.

3,787,383

POLYMERIZATION OF OLEFINIC COMPOUNDS AND CATALYSTS THEREFOR

Edward H. Mottus, Ballwin, and Morris R. Ort, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of application Ser. No. 621,036, Mar. 6, 1967, which is a continuation-in-part of application Ser. No. 539,662, Apr. 4, 1966, both now abandoned. This application Dec. 27, 1971, Ser. No. 212,612

Int. Cl. C08f *1/28, 1/56*

U.S. Cl. 260—92.8 R **14 Claims**

An electrolytic process is described for making certain bis-(halometal)methanes such as bis(dichloroaluminum)-methane, $Cl_2AlCH_2AlCl_2$, which is a new compound, and these compounds can be combined with transition metal compounds such as $VOCl_3$ to make very active catalysts for polymerizing olefinic compounds such as ethylene. In the electrolytic process boron, a Group II, Group III–A or Group IV–A metal, e.g. aluminum, is used as an anode with an electrolyte such as $HOAlCl_2$ in the presence of a methylene dihalide such as CH_2Cl_2 or a gem dihalide which does not readily dehydrohalogenate or alkylate. It is preferred to carry out the electrolysis in the presence of ethylene or another olefinic compound to promote conductivity. Also, it is preferred that all reactants be substantially free of water, except for small known amounts of water which may be added to promote electrolysis. Also, it is preferred to blanket the electrolysis with ethylene which also serves to promote conductivity, or an inert gas to exclude moisture, oxygen and other undesirable materials. The catalysts polymerize olefinic compounds to liquid or solid polymers depending on the particular catalyst used and the olefin being polymerized. The catalysts are promoted or modified by small amounts of water or other electron donor compounds.

3,787,384

CATALYSTS AND PROCESS FOR THE POLYMERIZATION OF OLEFINS

Jacques Stevens, Braine-l'Alleud, and Michel George, Waterloo, Belgium, assignors to Solvay & Cie, Brussels, Belgium

No Drawing. Continuation-in-part of application Ser. No. 5,128, Jan. 22, 1970, now Patent No. 3,718,636. This application Mar. 5, 1971, Ser. No. 121,541

Claims priority, application France, Mar. 5, 1970, 7007852

The portion of the term of the patent subsequent to Feb. 27, 1990, has been disclaimed

Int. Cl. B01j *11/84*; C08f *1/56, 3/06*

U.S. Cl. 260—94.9 DA **4 Claims**

The catalyst for the polymerization and copolymerization of olefins is composed of (a) at least one organometallic compound and (b) a solid catalytic component obtained by reacting a support comprised of silica, alumina or both silica and alumina with a compound of the formula MR_nX_{m-n} in which M is aluminum or magnesium, R is a hydrocarbon radical, X is hydrogen or halo-

gen, *m* is the valence of M and *n* is a whole number of not less than 1 nor greater than *m*, separating the solid product of the reaction, reacting this product with an excess of a halogen-containing transition metal compound and separating the solid reaction product. The polymerization of α-olefins and copolymerization of α-olefins with one another and with diolefins by means of the present catalysts are carried out with a high rate of productivity.

3,787,385

SYNTHETICALLY PRODUCED TETRAPEPTIDE HAVING THE ACTIVITY OF THE LUTEINIZING HORMONE RELEASING HORMONE

Karl Folkers, 6406 Mesa Drive 78731; Jaw-King Chang, 1500 E. Riverside Drive 78741; and Hans Sievertsson, 2217 S. Lakeshore Blvd. 78741, all of Austin, Tex.

No Drawing. Filed May 17, 1971, Ser. No. 144,294

Int. Cl. C07c *103/52*

U.S. Cl. 260—112.5 **1 Claim**

A new tetrapeptide, L-p-glutamyl-L-tyrosyl-L-arginyl-L-tyrptophan amide, having the hormonal activity of the luteinizing hormone releasing hormone (LRH) of the hypothalamus gland of mammals is provided by utilizing as key starting materials, the amino acids, glutamic acid, tyrosine, arginine, and tryptophan. Synthesis of the new tetrapeptide, is accomplished by coupling, in appropriate free or protected forms, any combination of these four amino acids to obtain the L-p-glutamyl-L-tyrosyl-L-arginyl-L-tryptophan amide.

3,787,386

TRIPEPTIDE

George Rogelio Flouret, Waukegan, and John Wayne Cole, Deerfield, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed Mar. 24, 1972, Ser. No. 237,876

Int. Cl. C07c *103/52*

U.S. Cl. 260—112.5 **7 Claims**

The tripeptide (O—R')Ser - (O—R'')Tyr - Gly-OR wherein R is hydrogen, methyl or benzyl and R' and R'' are protective groups on the hydroxy group of the tyrosyl and seryl moieties is a valuable intermediate for the manufacture of the gonadotropin-releasing hormone. It can easily be reacted to form the Nα-blocked fragment Trp-(O—R')Ser-(O—R'')Tyr-Gly-OH which reacts with Leu-(N^{ω}-R''')Arg-Pro-Gly-NH_2 carrying a protective group (R''') in the Arg moiety to the corresponding octapeptide from which Gn-RH can be obtained by removing the blocking group of Trp, reacting the deprotected octapeptide with N-protected histidine, removing the protective group of the latter, subsequently reacting the nonapeptide with N-protected pyroglutamic acid and removing all the protective groups, leaving only the unsubstituted decapeptide chain pyro - Glu-His-Trp-Ser-Tyr-Gly-Leu-Arg-Pro-Gly-NH_2.

3,787,387

2:1 METAL COMPLEXES OF 2,2',4'-TRIHYDROXY-3,5-DINITROAZOBENZENE BOUND TO A DIPHENYLAMINE THROUGH AN AZO BRIDGE

Heinz Wicki, Allschwil, Basel-Land, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

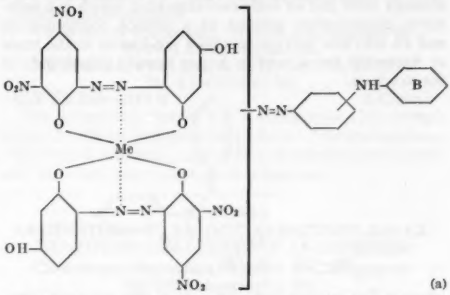
No Drawing. Filed Aug. 3, 1970, Ser. No. 60,748

Claims priority, application Switzerland, Aug. 7, 1969, 11,976/69

Int. Cl. C09b *45/26, 45/32;* **D06p** *3/32*

U.S. Cl. 260—145 A **12 Claims**

New metallized polyazo dyes which are notable for their improved power of exhaustion on leathers of low affinity and are used for dyeing and printing various types of leather. It is desirable for these dyes to contain as basic structural unit a group of the formula



(a)

in which the aromatic ring B bears preferably an

$$—SO_3H—$$

and an $—NO_2—$ group. The molecule may contain up to three additional arylazo groups but preferably not more than one.

3,787,388

THIAZOLYL-AZO-TETRAHYDROQUINOLINE COMPOUNDS

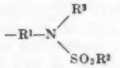
Max A. Weaver and David J. Wallace, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 590,188, Oct. 28, 1966. This application Apr. 19, 1972, Ser. No. 245,390

Int. Cl. C09b *29/36*

U.S. Cl. 260—155 **8 Claims**

Thiazolyl-azo-tetrahydroquinoline compounds in which the nitrogen atom of the tetrahydroquinoline coupling component is substituted with a group having the formula



wherein R^1 is alkylene and R^2 and R^3 each is alkyl, cycloalkyl or aryl. The disclosed compounds are useful for dyeing hydrophobic textile materials such as polyester fibers.

3,787,389

PYRAZOLIDONE DERIVATIVES

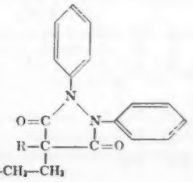
Georges Necrevergne, Bordeaux, France, assignor to The Purdue Frederick Company, Norwalk, Conn.

No Drawing. Application May 14, 1969, Ser. No. 856,508, now Patent No. 3,629,282, which is a division of application Ser. No. 691,197, Dec. 18, 1967, now Patent No. 3,487,046, which is a continuation-in-part of application Ser. No. 362,393, Apr. 24, 1964, which in turn is a continuation-in-part of application Ser. No. 121,796, Apr. 14, 1961, both now abandoned. Divided and this application Jan. 11, 1971, Ser. No. 105,714

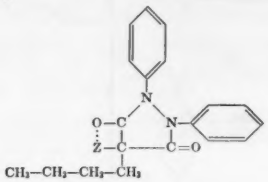
Int. Cl. C07c *47/18;* **C07d** *49/08*

U.S. Cl. 260—210 R **15 Claims**

Diphenylpyrazolidone derivatives, substituted on the 4 position and having the formula



wherein R is selected from the group consisting of glycoses of from 3 through 6 carbons in chain length, polyoxyethylene having a molecular weight of from 200 through 2000 and an ionic exchange resin which is a polymeric condensation product of a phenol, formaldehyde and an alkylene polyamine which are known in the trade as Amberlite resins, and hydrogen bonded compounds of the structure:



wherein Z is a compound of the group selected from align, gum guar, pectin, psyllium, dextran and polyvinylpyrrolidone and the methods for the preparation of the aforesaid compounds. The compounds are useful in achieving an anti-inflammatory effect.

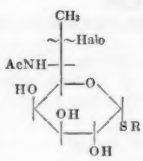
3,787,390

ANALOGS OF LINCOMYCIN AND PROCESS

Robert D. Birkenmeyer, Comstock, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed June 23, 1971, Ser. No. 156,099
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 R **6 Claims**

Clindamycin analogs of the formula



I

wherein Ac is the acyl of a 1-(2-hydroxyethyl)-L-2-pyrrolidinecarboxylic acid are prepared by N-alkylation of the corresponding 1-unsubstituted compounds. The compound has clindamycin-like antibacterial activity.

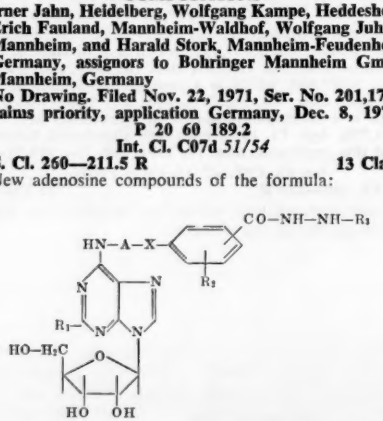
3,787,391

ADENOSINE COMPOUNDS AND THERAPEUTIC COMPOSITIONS

Werner Jahn, Heidelberg, Wolfgang Kampe, Heddesheim, Erich Fauland, Mannheim-Waldhof, Wolfgang Juhran, Mannheim, and Harald Stork, Mannheim-Feudenheim, Germany, assignors to Bohringer Mannheim GmbH, Mannheim, Germany

No Drawing. Filed Nov. 22, 1971, Ser. No. 201,174
Claims priority, application Germany, Dec. 8, 1970, P 20 60 189.2
Int. Cl. C07d *51/54*
U.S. Cl. 260—211.5 R **13 Claims**

New adenosine compounds of the formula:



(I)

wherein R_1 is hydrogen or halogen; R_2 is hydrogen, halogen, hydroxyl, alkyl or alkoxy; R_3 is hydrogen or —CO—R_4, wherein R_4 is aryl which is optionally substituted one or more times by halogen and/or alkyl, alkoxy and/or hydroxyalkyleneoxy; A is a straight-chained or branched alkylene radical containing up to 3 carbon atoms and X is a valency bond or oxygen; and the physiologically compatible salts thereof,

exhibit remarkable effectiveness in improving the blood circulation of mammals and also bring about a depression of serum lipids.

3,787,392

PROCESS FOR THE PREPARATION OF NUCLEOSIDE DIPHOSPHATE ESTERS

Hans Ulrich Bergmeyer, Tutzing, Eric Haid, Weilheim, Michael Nelboeck-Hochstetter, Tutzing, and Gunter Weimann, Percha, Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

No Drawing. Filed Nov. 26, 1971, Ser. No. 202,573
Claims priority, application Germany, Dec. 2, 1970, P 20 59 429.0
Int. Cl. C07d *51/50*
U.S. Cl. 260—211.5 R **14 Claims**

Nucleoside diphosphate esters are prepared by reacting a nucleoside monophosphate with a phosphoric acid ester in the presence of dicyclohexyl carbodiimide, wherein a methanol solution of a nucleoside monophosphoric acid and dicyclohexyl carbodiimide is slowly brought together with a 1 to 6.5 pH methanol solution of a phosphoric acid ester.

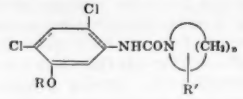
3,787,393

NOVEL UREA DERIVATIVES AND THEIR USE AS HERBICIDES

Masahiro Aya, Junichi Saito, Nobuo Fukazawa, Tatsuo Tamura, Kazuo Kurihara, and Norihisa Morishima, Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed June 28, 1972, Ser. No. 266,876
Claims priority, application Japan, June 30, 1971, 46/47,162
Int. Cl. C07d *27/04, 29/30, 41/04*
U.S. Cl. 260—239 BF **22 Claims**

New urea compounds of the formula



wherein

R is unsaturated lower alkyl, i.e., lower alkenyl of from 2 to 6, preferably 2 to 4, carbon atoms, or lower alkynyl of from 2 to 6, preferably 2 to 4, carbon atoms,

R′ is hydrogen or methyl, and

n is 4, 5 or 6

are excellent herbicides, particularly selective herbicides usable in rice cultivation.

3,787,394

19-NOR-7α-METHYL OR 19 - NOR-20-SPIROX-4,14-DIEN-3-ONE AND 18-METHYL DERIVATIVES THEREOF

Glen E. Arth, Cranford, and Gary H. Rasmusson, Watchung, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 67,615, Aug. 27, 1970. This application Oct. 4, 1972, Ser. No. 295,090
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 R **7 Claims**

The compounds, 19-nor-7α-methyl, 18-hydrogen or methyl-20-spirox-4,14-dien-3-one and the corresponding

19-nor-spiro-lactones are provided, prepared from the corresponding 19-nor-3-oxo-spirox-4,14-dienes. The compounds are useful as orally-effective antiestrogens and are also anabolic agents having low androgenicity.

3,787,395

13-ETHYL-11-OXYGENATED GONENES

Gordon Alan Hughes, Haverford, and Herchel Smith, Wayne, Pa., said Hughes assignor to said Smith

Continuation of application Ser. No. 110,336, Jan. 27, 1971, which is a continuation of application Ser. No. 790,569, Jan. 13, 1969, which is a continuation-in-part of application Ser. No. 602,785, Dec. 19, 1966, all now abandoned, which in turn is a continuation-in-part of application Ser. No. 228,384, Oct. 4, 1962, and Ser. No. 401,891, Oct. 6, 1964, now abandoned. This application Feb. 16, 1973, Ser. No. 333,085

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 C **8 Claims**

11-oxygenated 13-ethyl-gon-5(10)-en-3-ones and 13-ethyl-gon-4-en-3-ones with corticoidal activity are prepared from 13-ethyl-gona-1,3,5(10),9(11)-tetraenes by hydroboration and oxidation to the corresponding 11-oxygenated gona-1,3,5(10)-triene, Birch reduction to the gona-2,5(10)-diene and hydrolysis.

3,787,396

17-HYDROXY - 7 - (LOWER ALKOXY)CARBONYL-3-OXO-17α-PREGN-4-ENE-21-CARBOXYLIC ACID γ-LACTONES AND CONGENERS

Richard M. Weier, Deerfield, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 174,922, Aug. 25, 1971. This application Oct. 2, 1972, Ser. No. 294,379

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.57 **21 Claims**

Preparation and valuable biological properties—especially diuretic activity—of 17-hydroxy - 7 - (lower alkoxy)carbonyl-3-oxo-17α-pregn - 4 - ene-21-carboxylic acid γ-lactones, hydroxy acids and their salts corresponding thereto, and Δ^1 and thio ester analogs of these lactones, acids, and salts are disclosed.

3,787,397

ACETALS AND METHODS FOR THEIR PREPARATION

Anthony W. McCollum, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Aug. 16, 1971, Ser. No. 172,324

Int. Cl. C07d *13/04*

U.S. Cl. 260—240 E **9 Claims**

1,1,4,4-bis(ethylenedioxy) - 3,3-dimethyl-1-butene (referred to as ketene acetal) is prepared by reacting ethylene glycol with tetrahydro-2-isopropyl-6,6-dimethylfuro-(2,3-d)-1,3-dioxol-5-ol in the presence of an acid catalyst at a temperature of from about 110° to 170° C. The water of reaction is preferably removed by the use of a solvent which forms an azeotrope that boils between 110° to 170° C. In an alternative two-step process, tetrahydro-2-isopropyl-6,6-dimethylfuro-(2,3-d) - 1,3 - dioxol-5-ol is reacted with ethylene glycol in the presence of an acid catalyst at a temperature of from about 60° to 110° C. to form 2-hydroxy-3,3-dimethylsuccinaldehyde bis(ethylenedioxy)acetal (referred to as hydroxy acetal). The 2-hydroxy - 3,3 - dimethylsuccinaldehyde bis(ethylenedioxy) acetal is then heated to a temperature of from about 110° to 170° C. in the presence of an acid catalyst to give 1,1,4,4-bis(ethylenedioxy) - 3,3-dimethyl-1-butene. The water from the two-step process is preferably removed from the reaction as it is formed through the use of an azeotropic solvent. The ketene acetal is useful generally because of its reactive nature and for its ability to form oxetane polymers and polyesters. The hydroxy acetal is useful as a gel hardener, as a cross-linking agent for use with cellulose derivatives and polyols, and as a chemical intermediate.

3,787,398

3,4-DIHYDRO-2-(2-HYDROXY)ETHYL-1-(R-AMINO)-PYRAZINO[1,2-b] - 1,2 - BENZOTHIAZIN-11(2H)-ONE 6,6-DIOXIDES

Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Inc.

No Drawing. Filed Oct. 2, 1972, Ser. No. 294,116

Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R **4 Claims**

The compounds herein are 3,4-dihydro-2-(2-hydroxy) ethyl - 1 - (R-amino)-pyrazino[1,2-b]-1,2-benzothiazin-11 (2H)-one 6,6-dioxides, useful as anti-inflammatory agents and for other pharmacological properties.

3,787,399

3,4-DIHYDRO - 1 - METHYLPYRAZINO[1,2-b]-1,2-BENZOTHIAZIN-11(2H)-ONE 6,6-DIOXIDES

Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Inc.

No Drawing. Filed Oct. 2, 1972, Ser. No. 294,117

Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R **2 Claims**

The compounds herein are 3,4-dihydro-1-methyl-pyrazino[1,2-b] - 1,2 - benzothiazin-11(2H)-one 6,6-dioxides, useful for their ultra-violet absorbing properties.

3,787,400

1,2,3,4-TETRAHYDRO - 11 - HYDROXYPYRAZINO [1,2-b]-1,2 - BENZOTHIAZINE - 1,3 - DIONE 6,6-DIOXIDE

Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Inc.

No Drawing. Filed Oct. 2, 1972, Ser. No. 294,119

Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R **1 Claim**

The compound herein is 1,2,3,4-tetrahydro-11-hydroxy-pyrazino-[1,2-b]-1,2-benzothiazine-1,3 - dione 6,6-dioxide, useful for its ultra-violet absorbing properties.

3,787,401

NOVEL 1,2-BENZOTHIAZINE DIOXIDES

Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Inc.

No Drawing. Filed Oct. 2, 1972, Ser. No. 294,120

Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R **6 Claims**

The compounds herein are 1,2,3,4 - tetrahydro - 11-hydroxypyrazino[1,2-b] - 1,2 - benzothiazin - 1(2H) - one 6,6-dioxides, useful for their pharmacological properties and as precursors for useful compounds.

3,787,402

THIO-DERIVATIVES OF 1,2-BENZOTHIAZINE DIOXIDES

Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Inc.

No Drawing. Filed Oct. 2, 1972, Ser. No. 294,121

Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R **4 Claims**

The compounds herein are 1,2,3,4-tetrahydro-11-hydroxypyrazino[1,2-b]-1,2-benzothiazin-1(2H) - one 6,6-dioxides, useful for their ultraviolet absorption and central nervous system depressant activity.

3,787,403

AMINO-DERIVATIVES OF 1,2-BENZOTHIAZINE DIOXIDES

Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Inc.

No Drawing. Filed Oct. 2, 1972, Ser. No. 294,122

Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R **7 Claims**

The compounds herein are 1,2,3,4-tetrahydro-11-hydroxypyrazino[1,2-b]-1,2-benzothiazin-1(2H)-one 6,6-dioxides, useful for their ultra-violet absorption and pharmacological properties.

3,787,404
NOVEL 1,2-BENZOTHIAZINE DIOXIDES AND PRECURSORS THEREFOR

Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Inc.

No Drawing. Filed Oct. 2, 1972, Ser. No. 294,126
Int. Cl. C07d *93/02*
U.S. Cl. 260—243 R **3 Claims**

The compounds herein are:

(I) 2,3,5,6-tetrahydro - 13H - oxazolo[2',3',:3,4]pyrazino[1,2-b]-1,2-benzothiazin-13-one 8,8 - dioxide, useful for its anti-inflammatory and diuretic properties;

(II) (1,2,3,4-tetrahydro - 11 - hydroxy-1-oxopyrazino [1,2-b]-1,2-benzothiazin-2-yl)ethyl methanesulfonate 6,6-dioxide, useful as a precursor for making (I); and

(III) 1,2,3,4 - tetrahydro-11-hydroxy-2-(2-hydroxyethyl)pyrazino[1,2-b]-1,2-benzothiazin - 1 - one 6,6-dioxide, useful as a precursor for making (II).

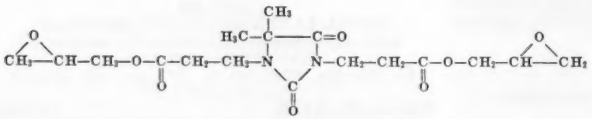
3,787,405
DIGLYCIDYL COMPOUNDS CONTAINING A N-HETEROCYCLIC RING

Daniel Porret, Binningen, and Willy Fatzer, Bottmingen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Nov. 9, 1971, Ser. No. 197,113
Claims priority, application Switzerland, Nov. 18, 1970, 17,022/70
Int. Cl. C07d *49/32, 51/18*
U.S. Cl. 260—260 **5 Claims**

Diglycidyl esters are produced by the reaction, in a known manner, of dicarboxylic acids of mononuclear N-heterocyclic compounds, e.g. N,N' - bis - (β - carboxyethyl) - 5,5 - dimethylhydantoin, with epihalogenhydrin, e.g. with epichlorohydrin.

Example: The new compound



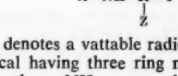
The new diglycidyl esters can be easily cured with all known epoxide resin curing agents, and are suitable for the production of moulded shapes possessing good mechanical properties.

3,787,406
TRIAZINYL VAT DYESTUFFS

Paul Ulrich and Max Staeuble, Basel, Fritz Kugler, Muttenz, and Max Jost, Oberwil, Basel-Land, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Apr. 16, 1970, Ser. No. 29,255
Claims priority, application Switzerland, Apr. 24, 1969, 6,356/69
Int. Cl. C07d *55/20*
U.S. Cl. 260—249 **5 Claims**

The invention relates to vat dyestuff of the general formula



(1)

wherein A denotes a vattable radical, X denotes a heterocyclic radical having three ring nitrogen atoms which is bounded to the —NH— group by a ring carbon atom, Y denotes an oxygen or sulphur atom, R denotes an aromatic radical free from azo groups which is bounded to the oxygen or sulphur atom Y by a carbon atom of the aromatic nucleus, which, when R represents a heterocyclic aromatic radical is an at least 6-membered heterocyclic aromatic radical, and Z denotes a radical

—NH—A'

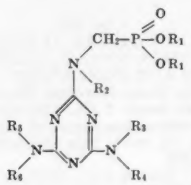
or a radical —Y—A', wherein Y has the above-mentioned significance and A' represents a vattable residue which are valuable dyestuffs for vat and pigment dyeing. The dyeings obtained are distinguished by very clear shades, interesting application properties and very good properties of wet fastness and fastness to light.

3,787,407
MELAMINE-DERIVATIVES

Udo Hendricks, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Aug. 27, 1971, Ser. No. 175,720
Claims priority, application Germany, Aug. 28, 1970, P 20 42 661.3
Int. Cl. C07d *55/24*
U.S. Cl. 260—249.6 **4 Claims**

New melamine derivatives of the general formula



in which the radicals R_1, independently of one another, mean a lower alkyl radical; and R_2, R_3, R_4, R_5 and R_6, independently of one another, mean a hydrogen atom, a hydroxymethyl group or a radical of the formula

a process for their production and their use as flameproofing agents for textile materials.

3,787,408
CERTAIN PYRAZOLO[1,5-a]PYRIMIDO [4,5-d]PYRIMIDINES

Akira Takamizawa, 73–6 Shimohozumi, Ibaraki, Japan, and Hisao Sato, 767 Tonda-cho, Takatsuki, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 869,379, Oct. 24, 1969. This application Nov. 16, 1971, Ser. No. 199,367
Claims priority, application Japan, Oct. 28, 1968, 43/78,432, 43/78,433, 43/78,435
Int. Cl. C07d *51/12*
U.S. Cl. 260—256.4 F **5 Claims**

Pyrazolopyrimidopyrimidine derivatives of the formula:

wherein R represents a hydrogen, lower alkyl, phenyl or phenyl(lower)alkyl and R^1 represents a hydrogen or phenyl, being useful as medicaments such as antipyretics, analgesics or anti-inflammatory agents, are prepared by four different routes.

3,787,409
2,4-DIAMINO-5-(3-ALKOXY-4,5-METHYLENEDIOXYBENZYL)PYRIMIDINE

Emanuel Grunberg, North Caldwell, and Max Hoffer, Nutley, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Dec. 1, 1971, Ser. No. 203,869
Int. Cl. C07d *51/42*
U.S. Cl. 260—256.4 N **2 Claims**

2,4-diamino-5-(3-alkoxy - 4,5 - methylenedioxybenzyl)-pyrimidines, prepared such as for example, 2,4-diamino-5-(3-methoxy-4,5 - methylenedioxybenzyl)pyrimidine from the corresponding benzaldehydes, are described. The end products are useful as potentiators of the antibacterial activity of sulfonamides, as well as antibiotics.

3,787,410
CARBOXYAMIDO SUBSTITUTED-2-ALKYLTHIO-5-PYRIMIDINESULFONAMIDES

Paul L. Anderson, Dover, and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Dec. 2, 1971, Ser. No. 204,296
Int. Cl. C07d *51/40, 51/42*
U.S. Cl. 260—256.5 R **1 Claim**

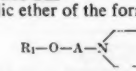
Carboxyamido substituted-2-alkylthio - 5 - pyrimidinesulfonamides, e.g., 4,6 - di - (p-chlorobenzoylamido)-2-methylthio-5-pyrimidinesulfonamide, are prepared by condensing 4,6-diamino-2-alkylthio-5-pyrimidinesulfonamides with benzoic or substituted benzoic acids or acid halides and are useful as anti-inflammatories.

3,787,411
HETEROCYCLIC ETHERS OF PIPERAZINE N ALKANOLS

Heinrich Ruschig, Bad Soden, Taunus, Karl Schmitt, Frankfurt am Main, Werner Mohler, Hofheim, Taunus, and Axel Göbel and Ernst Lindner, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Sept. 8, 1970, Ser. No. 70,486
Claims priority, application Germany, Sept. 12, 1969, P 19 46 172.4
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 PH **5 Claims**

A heterocyclic ether of the formula



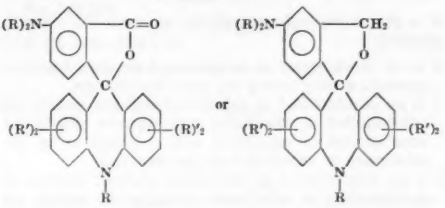
in which R_1 is 3-, 4- or 6-alkoxy-pyridyl-(2)-; 2-, 4-, 5-, or 6-alkoxy-pyridyl-(3); 2- or 3-alkoxy-pyridyl-(4) which have 1–4 carbon atoms in the alkoxy radical; 3-, 4-, 5- or 6-methyl-pyridyl-(2); 6 - ethyl - pyridyl - (4)-; 2,6-dimethyl-pyridyl-(4); R_2 is phenyl, o-tolyl, m-tolyl, p-tolyl, o-anisyl, m-anisyl, p-anisyl, o-chlorophenyl, m-chlorophenyl, p-chlorophenyl, pyridyl (2), pyridyl (3), pyridyl (4); 2-chloro-4-methyl-phenyl, 2-chloro - 4 - methoxyphenyl and 2-methoxy-4 - methyl - phenyl, 6 - methoxypyridyl (2), 2-methyl-pyridyl (4), 4,6-dimethyl-pyridyl (2) or their position isomers, and A is alkylene having from 2 to 6 carbon atoms wherein the same is ethylene, trimethylene, 2-methyl-ethylene, 3-methyl-ethylene, tetramethylene, 3-methyl-trimethylene, 2 - ethyl - ethylene, 1-ethyl-ethylene, pentamethylene, 4 - methyl - tetramethylene, 3-ethyl-trimethylene, 1-propyl - ethylene, 1 - isopropyl-ethylene, 1,2-dimethyl - ethylene, hexamethylene, 5-methyl-pentamethylene, 4 - ethyl - tetramethylene, 3 - propyl-trimethylene, 2-butyl-ethylene, 1 - butyl - ethylene or 1-methyl-3-ethyl-trimethylene; and physiologically tolerable acid addition salts thereof; these compounds have an α-sympatholytic action and are useful in the treament of shocks, migraine, hypertonia and blood circulation disorders of the extremities.

3,787,412
SUBSTITUTED DIALKYLAMINO-(PHTHAL(YL/AN) ACRIDAN COMPOUNDS

Troy Eugene Hoover, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed Mar. 14, 1972, Ser. No. 234,664
Int. Cl. C07d *37/12*
U.S. Cl. 260—279 R **4 Claims**

Colorless, but colorable acridan compounds are disclosed, which are represented by the formula:



wherein each R is an alkyl radical having 1 to 5 carbon atoms and each R′ is hydrogen, an alkyl radical having 1 to 5 carbon atoms, an alkoxy radical having 1 to 5 carbon atoms, a dialkylamino radical wherein each alkyl radical has 1 to 5 carbon atoms, an amino radical, a nitro radical or a halogen. These compounds are used in pressure-sensitive record material and in mark-forming manifold systems.

3,787,413
10-CARBAMOYL-PHENOTHIAZINE-3-SULFONAMIDE

Kenji Naka, Negaya, Masayasu Sugiyama, Osaka, and Saiko Nishibori, Takatsuki, Japan, assignors to Ono Pharmaceutical Co., Ltd.

No Drawing. Filed Dec. 13, 1971, Ser. No. 207,533
Claims priority, application Japan, Dec. 26, 1970, 45/128,980
Int. Cl. C07d *93/14*
U.S. Cl. 260—243 A **1 Claim**

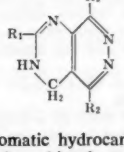
This invention relates to a novel compound i.e. 10-carbamoyl-phenothiazine-3-sulfonamide and also to a method for producing the same.

3,787,414
DIHYDROPYRIMIDOPYRIDAZINE DERIVATIVES

Shojiro Yurugi, Kyoto, and Shintaro Kikuchi, Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Oct. 4, 1971, Ser. No. 186,447
Claims priority, application Japan, Oct. 14, 1970, 45/90,713
Int. Cl. C07d *87/40*
U.S. Cl. 260—246 B **14 Claims**

Compounds of the formula



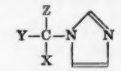
wherein R_1 is an aromatic hydrocarbon or heterocyclic group, such as phenyl or thienyl, and R_2 is a secondary or tertiary amine group, such as piperidino, cyclohexylamino, anilino or isopropylamino, have effective diuretic activity.

3,787,415
N-METHYL-IMIDAZOLE DERIVATIVES AND THEIR PRODUCTION

Wilfried Draber, Karl Heinz Büchel, Erik Regel, and Manfred Plempel, Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 2, 1971, Ser. No. 120,333
Claims priority, application Germany, Mar. 23, 1970, P 20 13 793.3
Int. Cl. C07d *51/76*
U.S. Cl. 260—250 R **11 Claims**

N-methyl-imidazole derivatives of the formula:



(I)

or a pharmaceutically acceptable non-toxic salt thereof, wherein

X is an unsubstituted or substituted 6-membered heteroaromatic moiety having two nitro heteroatoms,

Y is an unsubstituted or substituted aliphatic moiety, an unsubstituted or substituted cycloaliphatic moiety, an unsubstituted or substituted aralkyl moiety or an unsubstituted or substituted aryl moiety, and

Z is an unsubstituted or substituted aliphatic moiety, an unsubstituted or substituted cycloaliphatic moiety, an unsubstituted or substituted aralkyl moiety, an unsubstituted or substituted aryl moiety, an unsubstituted or substituted pyridyl moiety or an alkoxycarbonyl moiety,

are useful as antimycotic agents.

3,787,416
N-OXYALKYL-N'-HYDROCARBYL-HEXAHYDROPYRIMIDINES

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 826,721, May 21, 1969, now Patent No. 3,673,186, dated June 27, 1972, which is a continuation-in-part of application Ser. No. 370,079, May 25, 1964, now Patent No. 3,446,808, dated May 27, 1969. This application Dec. 30, 1971, Ser. No. 214,387
Int. Cl. C07d *51/18*
U.S. Cl. 260—251 R **8 Claims**

N-hydroxyalkyl-N'-hydrocarbyl - hexahydropyrimidines or N-alkoxyalkyl - N' - hydrocarbyl-hexahydropyrimidines in which the hydrocarbyl is sec-alkyl or cycloalkyl. A representative compound is N-methoxyethyl-N'-cyclohexyl-hexahydropyrimidine. The novel compounds possess utility as additives to retard deterioration of organic substances due to weathering, oxidation, corrosion, etc., curing catalysts for urethanes, intermediates for preparing pharmaceutcials, etc.

3,787,417
DIALKYLTIN SALTS OF SUBSTITUTED PYRIDINE-1-OXIDES

Charles W. Kaufman, Hamden, Conn., assignor to Olin Corporation

No Drawing. Application July 18, 1969, Ser. No. 843,218, now Patent No. 3,705,943, which is a continuation-in-part of abandoned application Ser. No. 596,801, Nov. 25, 1966. Divided and this application June 28, 1972, Ser. No. 266,948
Int. Cl. C07d *29/36*
U.S. Cl. 260—270 R **8 Claims**

Certain dialkyltin salts of 2-mercaptopyridine-1-oxide and 2-hydroxypyridine-1-oxide are prepared by reacting the respective oxides with a dialkyltin salt of a low molecular weight organic or inorganic acid. The resulting salts are highly effective bactericides and fungicides which have especially low toxicity to higher animals.

3,787,418
6-ALKYL-3-METHYLQUINALDINIC ACIDS

Michael Pang, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application Feb. 17, 1971, Ser. No. 116,065, now Patent No. 3,697,400. Divided and this application Apr. 5, 1972, Ser. No. 241,477
Int. Cl. C07d *33/48*
U.S. Cl. 260—287 R **3 Claims**

New 6-alkyl-3-methylquinaldinic acids and methods of synthesis are disclosed, which acids are useful in extracting copper from acidic leach solutions.

New quinaldinic acids and methods of synthesis are disclosed.

3,787,419
N-SUBSTITUTED-α,α,α-TRIFLUORO-m-TOLUAMIDES

William F. Bruce, Havertown, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed July 1, 1971, Ser. No. 159,059
Int. Cl. C07d *29/28, 29/30, 41/08*
U.S. Cl. 260—293.77 **1 Claim**

Disclosed are α,α,α-trifluoro-m-toluamides wherein the N is substituted with groups such as di(lower)alkylamino-(lower)alkyl, morpholino(lower)alkylamino, N-substituted-3 or 4-piperidylamino, piperidino(lower)alkylamino and N-substituted-1,3 or 1,4-hexahydro-1-H-diazepine. The compounds disclosed possess utility as central nervous system depressants useful in calming animals.

3,787,420
CYANOALKOXY (TRIFLUOROMETHYL) PYRIDINES

Florence E. Torba, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Application Mar. 17, 1969, Ser. No. 77,736, now Patent No. 3,705,170, which is a division of application Ser. No. 807,980, Mar. 17, 1969, now Patent No. 3,609,158. Divided and this application July 14, 1972, Ser. No. 272,017
Int. Cl. C07d *39/28*
U.S. Cl. 260—294.9 **2 Claims**

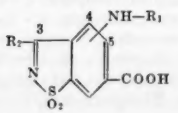
Disclosed as novel compounds are (trifluoromethyl) pyridine derivatives which are substituted by a hydroxy, mercapto, alkoxy, loweralkenoxy, aryloxy, alkylthio, alkylsulfonyl, arylsulfonyl, amino, hydrazino or oxylower-alkanoic acid or acid derivative group and optionally by chlorine and/or fluorine. Any remaining positions on the pyridine ring are taken up by hydrogen. The compounds have utility as herbicides and as active constituents of various miticidal, anthelmintic, fungicidal and bacteriocidal compositions.

3,787,421
SUBSTITUTED 6-CARBOXY-1,2-BENZISOTHIAZOLE-1,1-DIOXIDES

Peter Werner Feit, Gentofte, and Ole Bent Tvaermose Nielsen, Vanlose, Denmark, assignors to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

No Drawing. Filed June 16, 1971, Ser. No. 153,878
Claims priority, application Great Britain, June 30, 1970, 31,718/70
Int. Cl. C07d *91/12*
U.S. Cl. 260—294.8 C **29 Claims**

The invention relates to a series of new compounds, their salts and esters and to methods for the preparation of the compounds having the general formula:



in which the NH-R_1 group can be in the 4- or 5-position, R_1 represents an aliphatic radical with from 3 to 8 carbon atoms in the chain, or a mononuclear aromatically or a mononuclear heterocyclically substituted methyl or ethyl group, and R_2 represents an unsubstituted or substituted phenyl group.

3,787,422
HALOPYRIDYL THIOCYANATES

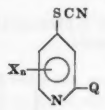
Penelope B. Domenico, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application June 30, 1971, Ser. No. 158,568. Divided and this application Feb. 9, 1973, Ser. No. 331,090

Int. Cl. C07d *31/48*

U.S. Cl. 260—294.8 F **2 Claims**

Compounds corresponding to the formula



wherein each X independently represents chloro or bromo; *n* represents an integer of from 1 to 3; and Q represents cyano (—CN), trifluoromethyl (—CF_3), methylsulfonyl (—SO_2CH_3), chloro or bromo are prepared and are useful as bactericides and fungicides.

3,787,423
β-PICOLYLOXY ESTER OF (3-TRIFLUOROMETHYLPHENOXY) (4-CHLOROPHENYL) ACETIC ACID AND DERIVATIVES

William A. Bolhofer, Frederick, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Mar. 8, 1972, Ser. No. 232,966

Int. Cl. C07d *31/36*

U.S. Cl. 260—295.5 R **3 Claims**

Heterocyclic methyl esters and N-(lower alkanesulfonyl) or N-(2-sulfoethyl)amides of (3-trifluoromethylphenoxy) (4-chlorophenyl)acetic acid which are useful in the treatment of atherosclerosis. The heterocyclic methyl esters and N-(lower alkanesulfonyl) or N-(2-sulfoethyl)-amides of (3-trifluoromethylphenoxy) (4-chlorophenyl)-acetic acid are prepared by reacting a (3-trifluoromethylphenoxy) (4-chlorophenyl)acetyl halide with a hydroxymethyl substituted heterocycle, with an alkali metal salt of a lower alkanesulfonamide or 2-aminoethanesulfonic acid.

3,787,424
DIALKYLAMINO ESTERS OF BENZOPYRANOPYRIDINES

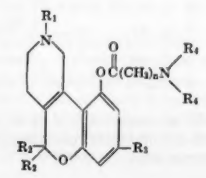
Harry George Pars, Lexington, and Raj Kumar Razdan, Belmont, Mass., assignors to Sharps Associates, Cambridge, Mass.

No Drawing. Filed May 8, 1972, Ser. No. 251,618

Int. Cl. C07d *31/34*

U.S. Cl. 260—295 T **6 Claims**

Dialkylamino esters of benzopyranopyridines represented by the formula



wherein R_1 is hydrogen, loweralkanoyl, cycloalkylloweralkyl, loweralkyl, cycloalkylloweralkanoyl, loweralkenyl, loweralkynyl, halologweralkenyl, phenyllowerallkyl, phenylloweralkenyl or phenyllowerallkynyl; R_2 is loweralkyl; R_3 is C_1–C_{20} alkyl or cycloalkyllowerallkyl; *n* is an integer from 1 to 6; and R_4 is hydrogen or loweralkyl; and the pharmaceutically acceptable acid addition salts thereof.

3,787,425
HALOPYRIDYL THIOCYANATES

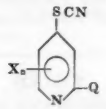
Penelope B. Domenico, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application June 30, 1971, Ser. No. 158,568. Divided and this application Feb. 9, 1973, Ser. No. 331,091

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 G **3 Claims**

Compounds corresponding to the formula



wherein each X independently represents chloro or bromo; *n* represents an integer of from 1 to 3; and Q represents cyano (—CN), trifluoromethyl (—CF_3), methylsulfonyl (—SO_2CH_3), chloro or bromo are prepared and are useful as bactericides and fungicides.

3,787,426
MANUFACTURE OF 1,1-DISUBSTITUTED-4,4-BIPYRIDYLIUM SALTS

John Edward Colchester and Thomas Blundell, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Feb. 24, 1971, Ser. No. 118,565

Claims priority, application Great Britain, Mar. 5, 1970, 10,679/70

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 D **25 Claims**

A process for the manufacture of a 1,1′-di(hydroxyalkyl)-4,4′-bipyridylium salt wherein each of the hydroxyalkyl substituents contains up to 10 carbon atoms which comprises reacting an N-hydroxyalkyl pyridinium salt with a cyanide under basic conditions and subsequently oxidizing the resulting interaction product to produce the bipyridylium salt.

3,787,427
PROCESS FOR THE MANUFACTURE OF BIPYRIDYLS

Sheila Antoinette Potter, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Aug. 12, 1971, Ser. No. 171,349

Claims priority, application Great Britain, Aug. 17, 1970, 39,481/70

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 D **8 Claims**

A process for the manufacture of bipyridyls which comprises heating a pyridine with a halogen, a 4-halopyridine or a 1-(4-pyridyl)-pyridinium halide at a temperature of at least 150° C.

3,787,428

U.V.-ABSORBING ORTHO-HYDROXYPHENYL SUBSTITUTED BIPYRIDINES

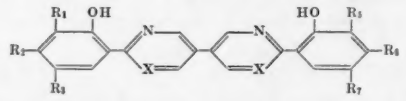
Jan-Erik Anders Otterstedt, Simrishamn, Sweden, and Richard Pater, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original application Feb. 24, 1969, Ser. No. 801,842, now Patent No. 3,660,404, dated May 2, 1972. Divided and this application Dec. 13, 1971, Ser. No. 207,616

Int. Cl. C07d *31/28, 31/46*

U.S. Cl. 260—296 D **8 Claims**

Ultraviolet absorbing bipyridyl of the formula



wherein R_{1-3} and R_{5-7} are selected from H, Cl, OH, C_{1-18} alkyl, C_{1-18} alkoxy and C_{1-18} acyloxy, and process for preparing same.

3,787,429

2-BENZYL AMINOPYRIDINE HAVING AT LEAST THREE SUBSTITUENTS IN THE BENZYL GROUP

Kurt Thiele and Walter E. von Bebenburg, Frankfurt, Germany, assignors to Deutsche Gold - und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

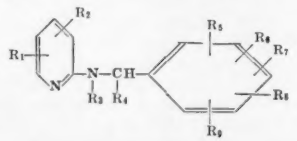
No Drawing. Application July 11, 1969, Ser. No. 842,438, now Patent No. 3,712,900, which is a continuation-in-part of abandoned application Ser. No. 762,321, Sept. 16, 1968, which in turn is a continuation-in-part of application Ser. No. 637,322, May 10, 1967, now Patent No. 3,481,743. Divided and this application Oct. 7, 1971, Ser. No. 187,543

The portion of the term of the patent subsequent to May 19, 1987, has been disclaimed

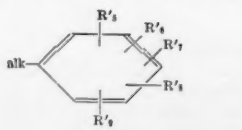
Int. Cl. C07d *31/36*

U.S. Cl. 260—295.5 C **8 Claims**

There are prepared pharmacological compounds of the formula



and their pharmacological acceptable acid addition salts wherein R_1 is amino, lower alkylamino, or amino acylated by carbonic acid, lower aliphatic monoesters of carbonic acid, aromatic monoesters of carbonic acid, benzoic acid, substituted benzoic acid, saturated or unsaturated straight or branched chain lower aliphatic mono or dicarboxylic acids, carbonic acid semi morpholide or carbonic acid semi piperidide, R_2 is hydrogen or R_1, R_3 is hydrogen, lower alkyl or acyl as defined for R_1, R_5, R_6, R_7, R_8 an R_9 are hydrogen, halogen, alkyl, trifluoromethyl, hydroxy, alkoxy, hydroxyalkyl, aliphatic acyl, carboxy or carboxyalkyl, R_4 is hydrogen, alkyl or



where alk is a 1 to 3 carbon atom straight or branched chain alkylene group which can be substituted with hydroxy, lower alkyl, lower alkoxy and R'_5, R'_6, R'_7, R'_8 and R'_9 have the same meaning as R_5, R_6, R_7, R_8 and R_9, when alk is unsubstituted at least one of R'_5, R'_6, R'_7, R'_8 or R'_9 is not hydrogen and if R_4 is hydrogen or alkyl at least 3 or R_5, R_6, R_7, R_8 and R_9 are not hydrogen.

3,787,430

DERIVATIVES OF DIPYRAZOLO[3,4-b; 3',4'-d] PYRIDINES

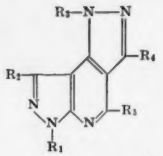
Hans Hoehn, Tegernheim, and Theodor Denzel, Nuremberg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Filed July 13, 1972, Ser. No. 271,477

Int. Cl. A61k *27/00;* **C07d** *49/18*

U.S. Cl. 260—296 H **12 Claims**

New derivatives of dipyrazolo[3,4-b; 3',4'-d]pyridines have the general formula



They and salts thereof are useful as central nervous system depressants. These compounds also increase the intracellular concentration of adenosine 3',5'-cyclic monophosphate.

3,787,431

CERTAIN 3,4,5-TRIPHENYLTHIAZOL-2-ONES

Siegfried Linke, Rudiger Sitt, Harald Horstmann, and Karl Meng, Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 12, 1971, Ser. No. 188,533

Claims priority, application Germany, Oct. 14, 1970, P 20 50 439.6

Int. Cl. C07d *91/24*

U.S. Cl. 260—306.7 **29 Claims**

4,5-diphenylthiazolones-(2) bearing an unsubstituted or substituted aryl group in the 3-position are prepared from the reaction of a desyl halide and an N-arylthiocarbamic acid O-ester. The compounds, of which 3-(4-nitrophenyl)-4,5-diphenylthiazolone-(2) is a representative embodiment, are hypolipemic agents.

3,787,432

DIALKYL ACETALS OF 2 - [3-(2-t-BUTYL-1,3,4-THIADIAZOL-5-YL)UREIDO] ACETALDEHYDE

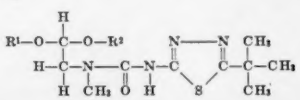
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Filed Dec. 16, 1971, Ser. No. 208,944

Int. Cl. C07d *91/62*

U.S. Cl. 260—306.8 D **4 Claims**

This invention discloses new chemical compounds of the formula



wherein R^1 and R^2 are each alkyl of up to 3 carbon atoms. Further disclosed are herbicidal compositions utilizing the above defined compounds.

3,787,433

2-SUBSTITUTED - 4,5,6,7 - TETRAHYDROBENZOTHIAZOLE-4-CARBOXYLIC ACIDS AND THEIR ALKYL ESTERS

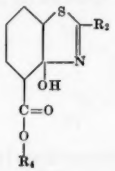
Peter H. L. Wei, 430 Ridge Lane, Springfield, Pa. 19064

No Drawing. Original application Mar. 17, 1971, Ser. No. 125,413, now Patent No. 3,694,450. Divided and this application May 31, 1972, Ser. No. 258,288

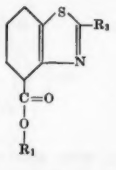
Int. Cl. C07d *91/46*

U.S. Cl. 260—306.8 R 5 Claims

Novel pharmacologically active compounds have been prepared which have the general formulae:



(I)



(II)

wherein R_1 is selected from the group consisting of hydrogen and (lower)alkyl; R_2 is selected from the group consisting of phenyl, halophenyl and (lower)alkylphenyl; R_3 is selected from the group consisting of phenyl, halophenyl, (lower)alkylphenyl, pyridyl, amino, anilino, hydrazino, benzylidenehydrazino, halobenzylidenehydrazino, nitrobenzylidenehydrazino and (lower)alkylbenzylidenehydrazino; R_4 is (lower)alkyl; and the pharmaceutically acceptable salts thereof.

3,787,434

HERBICIDAL 1,2,3-THIADIAZOL-5-YL UREAS

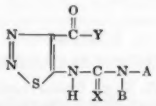
Gert Paul Volpp, Princeton, and Harry Dounchis, Lawrence Township, N.J., assignors to FMC Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 156,125, June 23, 1971. This application Mar. 27, 1972, Ser. No. 238,664

Int. Cl. C07d *91/54*

U.S. Cl. 260—306.8 D 17 Claims

A new class of herbicidal compounds of the formula:



where A is lower alkyl or alkenyl radical, B is —H or $—CH_3$, X is oxygen or sulfur, and Y is an alcohol or amine residue, and the metallic and amine salts thereof, has selective pre-emergence and post-emergence herbicidal activity. The synthesis of members of this class is described in detail, and the utility of representative compounds is exemplified.

3,787,435

4,5-BIS-(TRIFLUOROMETHYLIMINO)-DIAZOLES

Hans-Joachim Scholl, Cologne, Erich Klauke, Odenthal, Ferdinand Grewe, Burscheid, and Ingeborg Hammann, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

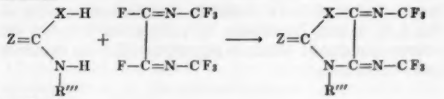
No Drawing. Filed Dec. 8, 1971, Ser. No. 206,159

Claims priority, application Germany, Dec. 18, 1970, P 20 62 346.5

Int. Cl. C07d *49/34, 57/02*

U.S. Cl. 260—309.2 9 Claims

4,5-bis-(trifluoromethylimino)oxazoles or diazoles are prepared by reacting the enol form of an amide or an imide of a carboxylic acid or carbonic acid, having at least one hydrogen atom on each of an oxygen and nitrogen or two nitrogen atoms vicinal to the amide carbon atom, with perfluoro-2,5-diazahexa-2,4-diene in the presence of a hydrogen fluoride acceptor at a temperature of about —50 to 120° C., in accordance with the following formula



in which

Z is oxygen, R—N= or

and X is oxygen or

and R, R′, R″ and R‴ each is hydrogen or various optionally substituted hydrocarbon or heterocyclic radicals, several of them together possibly forming a heterocyclic ring.

The invention also extends to compositions containing, and methods of using, the new compounds to combat fungi, insects and acarids.

3,787,436

2-(DIPHENYL AMINO-ALKYL AMINO)-2-IMIDAZOLINES

Claude Louis Clément Carron, Chatenay-Malabry, Bernard Philippe Bucher, L'Hay-les-Roses, and Alexandra Francine Jullien, Paris, France, assignors to Synthelabo S.A., Paris, France

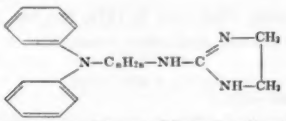
No Drawing. Filed Mar. 9, 1971, Ser. No. 122,515

Claims priority, application France, Mar. 12, 1970, 7008877

Int. Cl. C07d *49/34*

U.S. Cl. 260—309.6 3 Claims

2-(diphenyl amino-alkyl amino)-2-imidazolines having the formula



with *n* representing an integer of from 1 to 5 are disclosed. The acid addition salts from pharmaceutically acceptable organic and mineral acids are also disclosed. The materials have a bronchodilatory, anti-tussive and spasmolytic activity.

3,787,437

2-SILYL-1-METHYL IMIDAZOLES

Sandor Barcza, West Orange, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Feb. 14, 1972, Ser. No. 226,249

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 7 Claims

Substituted 2-silyl-1-methyl imidazoles, e.g., 2-(phenyldimethyl)silyl-1-methyl imidazole, are prepared by reacting substituted silyl halides with metalated imidazole, and are useful by reason of their pharmacological activity in animals, e.g. as sedative-hypnotics.

3,787,438

4,6-DIHYDROXY-N,N'BIS(3-OXO-1-ISOINDOLINYLIDENE)ISOPHTHALAMIDE AND SUBSTITUTION PRODUCTS

Daniel Walter Thomas, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Mar. 13, 1972, Ser. No. 234,329

Int. Cl. C07d *27/50*

U.S. Cl. 260—325 5 Claims

The 4,6 - dihydroxy - N,N'bis(3 - oxo - 1 - isoindolinylidene) isophthalamides, both unsubstituted, and in

which the isophthalic acid ring is substituted in the 2 and/or 5 position by independently, chlorine, bromine and lower alkyl, and in the isoindole rings in one or more of the 4, 5, 6, and 7 positions by chlorine or bromine are yellow compounds which in pigmentary size are excellent yellow pigments.

3,787,439

IMIDO-SUBSTITUTED ORGANOPOLYSILOXANE COMPOSITIONS

Fred P. Holub and Milton L. Evans, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Original application May 5, 1969, Ser. No. 821,966, now Patent No. 3,558,741. Divided and this application Aug. 26, 1970, Ser. No. 67,210

Int. Cl. C07d *27/52*

U.S. Cl. 260—326 E **11 Claims**

Curable organopolysiloxane compositions are provided and a method for making them, comprising organopolysiloxane having one or more aliphatically unsaturated imido organo radicals attached to silicon through a carbon-silicon bond. The curable organopolysiloxane compositions can be in the form of blends of such imido-substituted organopolysiloxane in combination with at least one olefinically unsaturated monomer, such as N-phenylmaleimide, bismaleimide, styrene, etc., or at least one polymer, such as polycarbonate, polyvinylchloride, etc., or mixtures thereof.

3,787,440

3-SULFAMYL-4-CHLOROBENZOIC ACID DERIVATIVES

Sachiyuki Hamano and Takaharu Nakamura, Tokyo, Shizuo Kuriyama, Saitama Prefecture, and Motosuke Yamanaka, Tokyo, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

No Drawing. Filed Nov. 9, 1971, Ser. No. 197,119

Claims priority, application Japan, Nov. 9, 1970, 45/97,931

Int. Cl. C07d *27/48*

U.S. Cl. 260—326.1 **5 Claims**

New 3-sulfamyl-4-chlorobenzoic acid derivatives, more particularly, 2-chloro-5-{2-[4,7-methano-Δ^5-tetrahydro (or 4,7-methanohexahydro)-isoindolinocarbonyl (or isoindolino-aminocarbonyl)]}benzene sulfonamide having marked diuretic and anti-hypertensive activities with low toxicity, as well as the synthetic preparation thereof are provided. The new compounds may advantageously be administered per os for therapeutical treatment of diseases such as cardiac, renal and hepatic edemas and also of hypertensions such as essential, renal and juvenile hypertensions.

3,787,441

SULTONE RECOVERY

Carl D. Kennedy, Claude D. Butler, Delmar D. Krehbiel, and Gene E. Nicks, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed May 3, 1971, Ser. No. 139,910

Int. Cl. C07d *89/06, 89/12*

U.S. Cl. 260—327 S **4 Claims**

A sultone is recovered from a mixture consisting essentially of a sultone and an alkenesulfonic acid by dissolving the mixture in a solution consisting essentially of a lower alcohol plus water or a ketone plus water, cooling the resulting second solution to precipitate the sultone, and separating the precipitated sultone from the mother liquor, as by filtration or centrifugation.

3,787,442

TETRAHYDRO-2H-THIOPYRAN-4-SULFAMIC ACIDS AND SALTS

Gerhard R. Wendt, Havertown, and Michael W. Winkley, Malvern, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Jan. 26, 1973, Ser. No. 326,703

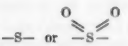
Int. Cl. C07d *65/04*

U.S. Cl. 260—327 TH **8 Claims**

Compounds of the formula:

in which

R is hydrogen, lower alkyl or hydroxy(lower)alkyl;
M is hydrogen, an alkali metal or an alkaline earth metal; and
Y is



are non-nutritive artificial sweeteners.

3,787,443

ARYLOXY EPITHIO ETHERS

Donald W. Erickson, Cupertino, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Feb. 25, 1971, Ser. No. 119,042

Int. Cl. C07d *1/18, 59/00*

U.S. Cl. 260—327 E **10 Claims**

Novel phenyl ethers, phenyl thioethers and derivatives thereof having a side chain of six to twelve carbon atoms with lower alkyl substituent at C–2 and C–5 or C–3 and C–6 which is saturated, mono-unsaturated or substituted with oxido, epithio or halo useful for insect control.

3,787,444

DIBENZO[b,f]THIEPIN-10-CARBOXYLIC ACIDS

Jacques Gosteli, Basel, Switzerland, assignor to Ciba-Geigy Corporation

No Drawing. Filed Dec. 30, 1971, Ser. No. 214,475

Claims priority, application Switzerland, Jan. 8, 1971, 243/71

Int. Cl. A61k *27/00*; C07d *67/00*

U.S. Cl. 260—327 B **3 Claims**

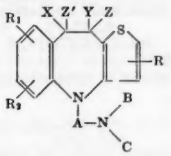
A new process for the production of N-substituted dibenzo[b,f]thiepin-10-methylamines and closely related compounds is provided, which process consists essentially in reducing corresponding amides of dibenzo[b,f]thiepin-10-carboxylic acids with complex hydrides. Further are provided processes for the production of dibenzo[b,f]thiepin-10-carboxylic acids used for the preparation of said amides. The dibenzo[b,f]thiepin-10-carboxylic acids are novel compounds which also possess pharmacological, particularly anti-inflammatory properties and are active ingredients for pharmaceutical compositions. A typical embodiment is the condensation of O-(phenylthio)-benzaldehyde with hippuric acid, which leads with or without isolation of intermediates to dibenzo[b,f]thiepin-10-carboxylic acid, conversion thereof into its chloride, reaction of the latter with dimethylamine and reduction of the dimethylamide obtained with lithium aluminium hydride in the presence of an ethereal solvent to N,N-dimethyldibenzo[b,f]thiepin-10-methylamine.

3,787,445
THIENOBENZAZEPINES

Lucien Nedelec, Le Raincy, Jacques Guillaume, Aulnay-sous-Bois, and Andre Allais, Les Lilas, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed Feb. 28, 1972, Ser. No. 230,124
Claims priority, application France, Mar. 1, 1971, 7106917
Int. Cl. A61k *27/00;* **C07d** *63/18*
U.S. Cl. 260—332.3 P **11 Claims**

Novel 4-(alkyaminoalkyl)-[4H]-thieno-[3,2-b][f]benzazepines of the formula



(I)

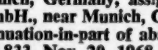
wherein R_1 and R_2 are selected from the group consisting of hydrogen, halogen, $—CF_3$, lower alkoxy optionally substituted, lower alkylthio, lower alkyl, optionally substituted sulfonamide, diloweralkylamino and acylamino wherein the acyl is derived from an organic carboxylic acid of 1 to 18 carbon atoms, R is selected from the group consisting of hydrogen and lower alkyl, A is alkylene of 2 to 5 carbon atoms, optionally substituted by lower alkyl, B is selected from the group consisting of hydrogen, lower alkyl and arloweralkyl, C is selected from the group consisting of lower alkyl and arloweralkyl and B and C taken together are alkylene of 2 to 6 carbon atoms optionally interrupted with 1 or 2 heteroatoms, Y is selected from the group consisting of hydrogen, hydroxy, lower alkoxy and lower alkanoyloxy, X is hydrogen and taken together with Y forms a carbon-carbon double bond, Z' is selected from the group consisting of hydrogen and lower alkyl and Z is selected from the group consisting of hydrogen, lower alkyl and lower alkoxy and taken with Y forms a member of the group consisting of =O, lower alkylenedioxy, lower alkylenedithio and thioloweralkyleneoxy and their non-toxic, pharmaceutically acceptable acid addition salts having antidepressant activity with a large therapeutic index and their preparation and novel intermediates.

3,787,446
PROCESS FOR PRODUCING 3,5-DIHYDROXY 1,2-DIOXOLANES

Wolfgang Edl, Munich, Germany, assignor to Peroxid-Chemie GmbH., near Munich, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 798,833, Nov. 20, 1968. This application Aug. 23, 1971, Ser. No. 174,262
Claims priority, application Netherlands, Nov. 23, 1967, 6715914
Int. Cl. C07d *13/00*
U.S. Cl. 260—340.9 **18 Claims**

3,5-dihydroxy 1,2-dioxolanes are prepared by reacting in the presence of a catalytic quantity of a base, a diketone having the formula



and hdyrogen peroxide wherein R and R^1 are alkyl groups having from 1 to 6 carbon atoms and R^2 is selected from the group consisting of hydrogen and alkyl groups having from 1 to 6 carbon atoms. When the reaction is conducted in the presence of an organic diluent in which the reaction product is insoluble, it is desirable to use concentrations of hydrogen peroxide in excess of 50% w./w. and the use of such diluents is desirable due to the formation of a granular product. The reaction may also be conducted in the presence of an organic solvent such as an organic acid corresponding to the diketone reactant which dissolves the dioxolane product. The use of an organic solvent is advantageous for producing substantially pure products with minimum purification. The 3,5-dihydroxy-1,2-dioxolanes are useful in the polymerization of vinyl compounds or in the cross-linking of unsaturated polyester resins.

3,787,447
PROCESS FOR THE PREPARATION OF 3-ACETOXY PHTHALIDE

Pierre Raoul, Epinay-sur-Orge, France, assignor to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France

No Drawing. Filed May 25, 1970, Ser. No. 41,159
Claims priority, application France, June 3, 1969, 6918215
Int. Cl. C07d *5/32*
U.S. Cl. 260—343.3 **9 Claims**

This invention is addressed to a new and improved process for the preparation of 3-acetoxy phthalide from orthoxylene in which orthoxylene in acetic acid or a mixture of acetic acid and acetic anhydride is oxidized to form the 3-acetoxy phthalide and phthalic anhydride.

3,787,448
10-OXAPROSTANOIC ACID DERIVATIVES

Junichi Himizu, Urawa, Shoichi Harigaya, Kawasaki, Akihiko Ishida, Ageo, Kaoru Yoshikawa, Omiya, and Masanori Sato, Kuki, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

No Drawing. Filed June 8, 1972, Ser. No. 260,963
Claims priority, application Japan, June 15, 1971, 46/42,722
Int. Cl. C07d *5/06*
U.S. Cl. 260—343.6 **11 Claims**

Lower-alkyl 7-(4β-formyl-oxolane-2-one-3α-yl)-heptanoate is condensed with 2-oxo-heptylene triphenyl phosphate or di-lower-alkyl 2-oxo-heptyl-phosphate. Lower-alkyl 9,15-dioxo-13,14-didehydro-10-oxaprostanoate (A) thus obtained is hydrogenated to give lower-alkyl 9,15-dioxo-10-oxaprostanoate (B) in the presence of a catalyst (e.g., palladium, palladium-carbon). The resultant compound (A) or (B) is further reduced with a metal borohydride to give lower-alkyl 9-oxo-13,14-didehydro-15-hydroxy-10-oxaprostanoate (D) or lower-alkyl 9-oxo-15-hydroxy-10-oxaprostanoate (C), followed by optional acylation of the compound (D) to give lower-alkyl 9-oxo-13,14-didehydro-15-acyloxy-10-oxaprostanoate (G). Furthermore, 9-oxo-15-hydroxy-10-oxaprostanoic acid (E) or 9-oxo-13,14-didehydro-15-hydroxy-10-oxaprostanoic acid (F) is prepared by hydrolyzing the compound (C) or (D). The 10-oxaprostanoic acid derivatives (A), (B), (C), (D), (E), (F) and (G) are all useful for treatment of gastro-intestinal dissorders, blood pressure disorders and as stimulating agents for childbirth, abortion and labor.

3,787,449
MANUFACTURE OF 2-(3-HYDROXY-3-OPTIONALLY ALKYLATED-1-ALKYNYL)-3-HYDROXY-5-OXOCYCLOPENT-1-ENEALKANOIC ACIDS AND ESTERS

Paul W. Collins, Deerfield, and Raphael Pappo, Skokie, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed July 10, 1972, Ser. No. 270,434
Int. Cl. C07d *7/04*
U.S. Cl. 260—345.7 **9 Claims**

Treatment of 2-alkoxy-4-hydroxy-5-oxocyclopent-1-enealkonic acids and their lower alkyl esters with lithium tetra(3-[tetrahydropyran-2-yl]oxy-1-alkynyl) aluminate affords the corresponding 2-(3-[tetrahydropyran-2-yl]oxy-1-alkynyl)-3-hyrdoxy-5-oxocyclopent-1-enealkanoic acids and esters. Subsequent cleavage of the ether function yields the 2-(3-hydroxy-1-alkynyl)-3-hydroxy-5-oxocyclopent-1-enealkanoic acids and esters. The latter compounds are

useful as pharmacological agents as is evidenced by their anti-ulcerogenic, hypotensive and smooth muscle-stimulating properties.

3,787,450
METHOD OF PRODUCING SODIUM ALUMINUM HYDRIDES

Bohuslav Casensky, 6 E. Kransnohorske, Praha, Czechoslovakia; Jiri Machacek, 66 Hlavni, Krumvir, Czechoslovakia; and Jaroslav Vit, % Peter Andrews, P.O. Box 8145 SW. Station, Washington, D.C.

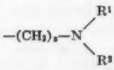
No Drawing. Application Mar. 25, 1970, Ser. No. 22,669, now Patent No. 3,728,272, which is a division of application Ser. No. 626,664, Mar. 24, 1967, now Patent No. 3,507,895, which in turn is a continuation-in-part of abandoned application Ser. No. 611,845, Jan. 26, 1967. Divided and this application Apr. 22, 1971, Ser. No. 136,595

Claims priority, application Czechoslovakia, Jan. 31, 1966, 604/66

Int. Cl. C07d *9/00*; C07f *5/06*

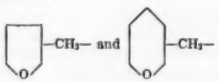
U.S. Cl. 260—345.9 **7 Claims**

(A) Compounds of the formula $NaAlH_x(OR)_{4-x}$ wherein R is



x is 1 or 2, z is an integer from 2 to 4 and R^1 and R^2 are the same or different and are selected from the group consisting of alkyl of 1 to 4 carbon atoms and an aliphatic ether alkyl group having a total of 2 to 4 carbon atoms and z has the same meaning as above, and

(B) Compounds of the formula $NaAlH_x(OR^3)_{4-x}$, wherein x is 1 or 2 and R^3 is (alkylene $O)_yR^4$, wherein alkylene has 2 to 4 carbon atoms, y is 1 to 4 and R^4 is selected from the group consisting of alkyl of 1 to 4 carbon atoms, phenyl,



are formed by hydrogenating sodium, aluminum and

(a) in case of Compounds A: a compound selected from the group consisting of $AlH_m(OR)_{3-m}$,

$$NaAlH_m(OR)_{4-m}$$

and ROH, R having the meaning as above.

(b) in case of Compounds B: a compound selected from the group consisting of $AlH_m(OR^3)_{3-m}$,

$$NaAlH_m(OR^3)_{4-m}$$

and R^3OH, R^3 having the same meaning as above and m in both cases being 0, 1 or 2,

the said reaction being carried out at an elevated temperature and pressure in an inert aromatic hydrocarbon or ether medium, and the ratio of Na to R in the reaction being between 1:1 and 1:3.

The invention also embraces certain liquid reactants comprising one of the above compounds in solution in an aromatic hydrocarbon or ether medium.

3,787,451
EPOXIDES OF ALKOXY-SUBSTITUTED TRI(HYDROXYPHENYL)ALKANES

Raymond W. Mah, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 19, 1971, Ser. No. 173,257

Int. Cl. C07d *1/18*

U.S. Cl. 260—348 R **3 Claims**

The invention comprises polyglycidyl ethers of alkoxy-substituted tri(hydroxyphenyl)alkanes, their blends with other epoxy compounds and their cured products. These epoxides are prepared by a process wherein the coupling reaction is carried out under different conditions than the subsequent dehydrohalogenation step. The resulting epoxides demonstrate superior and unexpected combinations of high-temperature properties and flex strengths.

3,787,452
EPOXYSILANES

Ernst Leumann, Arlesheim, and Hans Lehmann, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

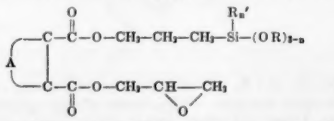
No Drawing. Filed June 23, 1972, Ser. No. 265,919

Claims priority, application Switzerland, June 29, 1971, 9,527/71

Int. Cl. C07d *1/18*

U.S. Cl. 260—348 SC **4 Claims**

The invention relates to epoxysilanes of the Formula I



(I)

in which A denotes a cycloaliphatic five-membered or six-membered ring or an aromatic ring, R and R′ each denote an alkyl group with 1 to 4 carbon atoms and n denotes 0, 1 or 2, and their use in adhesives, to which they impart increased resistance to tropical conditions and to water. Embodiments of the invention are glycidyltrieth-oxysilyl esters of tetra- or hexa-hydrophthalic acid.

3,787,453
STEROID CARBAMATES

Kenneth Earl Fahrenholtz, Bloomfield, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Oct. 26, 1971, Ser. No. 192,306

Int. Cl. C07c *169/20*

U.S. Cl. 260—397.4 **19 Claims**

Carbamic acid esters of 3β-hydroxy-Δ^4 or Δ^5-steroids, which can be optionally substituted with chlorine in the 4 and/or 6-positions and which are useful as progestational, androgenic, anabolic, antiestrogenic and/or antigonadotropic agents, and a process for preparing these carbamic acid esters.

3,787,454
NOVEL 6α-FLUORO-16α,18-DIMETHYL-1,4-PREGNADIENE-3,20-DIONES

Ulrich Kerb, Rudolf Wiechert, Karl Petzoldt, Klaus Kieslich, and Karl Heinz Kolb, Berlin, West Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

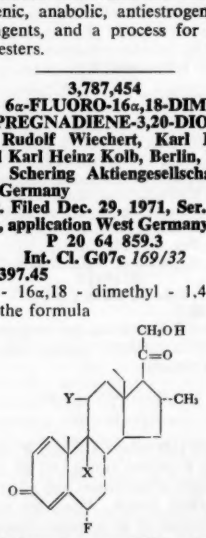
No Drawing. Filed Dec. 29, 1971, Ser. No. 213,711

Claims priority, application West Germany, Dec. 30, 1970, P 20 64 859.3

Int. Cl. G07c *169/32*

U.S. Cl. 260—397.45 **13 Claims**

6α - fluoro - 16α,18 - dimethyl - 1,4 - pregnadiene-3,20-diones of the formula



wherein X is a halogen atom and Y is a hydroxy group or a halogen atom having an atomic weight no greater than X, and physiologically acceptable 21-esters thereof, possessing anti-inflammatory activity, especially topical anti-inflammatory activity.

3,787,455

VINYL CHLORIDE PLASTIC COMPOSITIONS AND CERTAIN PLASTICIZERS THEREFOR

Robert R. Mod, Frank C. Magne, and Evald L. Skau, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Dawing. Application Nov. 13, 1969, Ser. No. 876,556, now Patent No. 3,644,478, which is a division of application Ser. No. 683,060, Oct. 12, 1967, now abandoned, which in turn is a division of application Ser. No. 529,652, Feb. 24, 1966, now Patent No. 3,403,126. Divided and this application May 7, 1971, Ser. No. 141,361

Int. Cl. C07c *103/30*

U.S. Cl. 260—404 **5 Claims**

The invention provides an N-alkyl-N-2-acetoxyethyl-oleamide wherein the alkyl group contains from 1–4 carbon atoms, which is useful as a plasticizer for vinyl chloride resins.

3,787,456

VINYL CHLORIDE PLASTIC COMPOSITIONS AND CERTAIN PLASTICIZERS THEREFOR

Robert R. Mod, 4550 Arthur Drive 70127; Frank C. Magne, 2330 Franklin Ave. 70117; and Evald L. Skau, 6473 Memphis St. 70124, all of New Orleans, La.

No Drawing. Application May 7, 1971, Ser. No. 141,361, which is a division of application Ser. No. 876,556, Nov. 13, 1969, now Patent No. 3,644,478, which is a division of application Ser. No. 683,060, Oct. 12, 1967, now abandoned, which in turn is a division of application Ser. No. 529,652, Feb. 24, 1966, now Patent No. 3,403,126. Divided and this application Sept. 13, 1972, Ser. No. 288,840

Int. Cl. C07c *103/30*

U.S. Cl. 260—404 **1 Claim**

The invention provides N-benzyl-N - 2 - acetoxyethyl-oleamide, which is useful as a plasticizer for vinyl chloride resins.

3,787,457

VINYL CHLORIDE PLASTIC COMPOSITIONS AND CERTAIN PLASTICIZERS THEREFOR

Robert R. Mod, 4550 Arthur Drive 70127; Frank C. Magne, 2330 Franklin Ave. 70117; and Evald L. Skau, 6473 Memphis St. 70124, all of New Orleans, La.

No Drawing. Application May 7, 1971, Ser. No. 141,361, which is a division of application Ser. No. 876,556, Nov. 13, 1969, now Patent No. 3,644,478, which is a division of application Ser. No. 683,060, Oct. 12, 1967, now abandoned, which in turn is a division of application Ser. No. 529,652, Feb. 24, 1966, now Patent No. 3,403,126. Divided and this application Sept. 13, 1972, Ser. No. 288,802

Int. Cl. C07c *103/30*

U.S. Cl. 260—404 **1 Claim**

The invention provides an N-alkyl-N-3-ethoxypropyl-oleamide, wherein the alkyl group contains 1–4 carbon atoms, which is useful as a plasticizer for vinyl chloride resins.

3,787,458

OIL-SOLUBLE ALIPHATIC ACID MODIFIED HIGH MOLECULAR WEIGHT MANNICH CONDENSATION PRODUCTS

Edmund J. Piasek, Chicago, and Robert E. Karll, Batavia, Ill., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 54,558, July 13, 1970. This application Aug. 31, 1970, Ser. No. 68,469

Int. Cl. C09f *7/00*

U.S. Cl. 260—404.5 **10 Claims**

The thermal oxidation stability of aliphatic acid-modified high molecular weight Mannich condensation products, which are prepared by reacting (1) a high molecular weight alkyl-substituted hydroxy aromatic compound, in which the alkyl-substituent has an average molecular weight of from about 600 to about 100,000, (2) an amine compound containing at least one HN< group, (3) an aliphatic aldehyde, and (4) an aliphatic acid containing at least six carbon atoms, in the reactant molar ratio of 1:0.1–10:1–10:0.014–1.0, respectively, are improved by reacting such modified Mannich condensation products with from about 2 to about 6 moles of an aliphatic aldehyde per mole of the alkyl-substituted hydroxy aromatic compound used in preparing the modified Mannich condensation product. The products of the herein-described invention are oil-soluble, and are highly effective additives for imparting dispersant-detergent properties to lubricant oil compositions. Lubricants containing these products provide a high degree of protection against the deposition of sludge and varnish, and corrosion when used as crankcase lubricant additives.

3,787,459

SELECTIVE HYDROFORMYLATION OF UNSATURATED FATTY COMPOUNDS

Edwin N. Frankel, Peoria, Ill., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Oct. 23, 1970, Ser. No. 83,618

Int. Cl. C07c *59/28, 69/66;* C11c *3/00*

U.S. Cl. 260—410.7 **11 Claims**

A process is described for converting unsaturated vegetable oil material without isomerization into high yields of formyl products which can be subsequently reduced to the corresponding hydroxymethyl products or oxidized to the corresponding carboxy products. The conversion is accomplished by reacting vegetable oil material with hydrogen and carbon monoxide in the presence of a highly selective catalyst system.

3,787,460

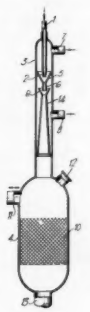
PROCESS FOR SPLITTING SOAPSTOCK AND APPARATUS THEREFOR

Roger Gadefaix, Issy-les-Moulineaux, and Jean Klere, Colombes, France, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 17, 1969, Ser. No. 885,762

Int. Cl. C11c *1/00*

U.S. Cl. 260—418 **8 Claims**



The invention provides a process and apparatus for splitting soapstock by acid treatment to liberate free fatty acids in the form of acid oil. The reactants are aspirated one into the other, preferably by the use of the Venturi principle, particularly in an arrangement in which two Venturi pipes, each with its own induction manifold, are

arranged in tandem to deliver into a collection vessel. First one reactant liquid and then the other is aspirated through the separate manifolds by the action of an aspirating fluid such as steam serving the system and are thereby intimately admixed with one another. The arrangement minimizes the heavy corrosive effects which result from the use of mechanical mixing devices.

3,787,461

ORGANOMETALLIC DERIVATIVES OF PERFLUOROCYCLOALKENES

Joseph D. Park, Boulder, Colo., and Sam Kwon Choi, Stamford, Conn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of abandoned application Ser. No. 8,687, Feb. 4, 1970. This application Aug. 25, 1971, Ser. No. 174,991

Int. Cl. C07f *7/00, 3/10*

U.S. Cl. 260—429 R **4 Claims**

Organometallic compounds in which olefinically unsaturated fluoroalicyclic groups are bonded to two metal radicals through two of the vinylic carbon atoms. The compounds can be prepared by metal interchange with an alkali metal derivative of the fluoroalicyclic olefin. The compounds are useful as thermally and hydrolytically stable plasticizers for polymers, as lubricants and as lubricant additives for cryogenic equipment.

3,787,462

PROCESS FOR THE PRODUCTION OF PALLADIUM ACETYL ACETONATE OF LOW CHLORINE CONTENT

Wolfgang Swodenk, Odenthal-Globusch, Gerhard Scharfe, Leverkusen, and Wolfram Dornfeldt, Leichlingen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 11, 1972, Ser. No. 225,677

Int. Cl. C07f *15/00*

U.S. Cl. 260—429 J **4 Claims**

A high purity palladium acetyl acetonate is obtained at low reaction times by precipitating a palladium compound from an aqueous alkali palladium chloride solution with an alkali metal hydroxide, converting the precipitate to the palladium acetyl acetonate with acetyl acetone, and washing and drying the acetonate.

3,787,463

AMINE GOLD COMPLEX USEFUL FOR THE ELECTRODEPOSITION OF GOLD AND ITS ALLOYS

Franco Zuntini, Giuseppe Aliprandini, Jean-Michel Gioria, Andre Meyer, and Salvatore Losi, Geneva, Switzerland, assignors to Oxy Metal Finishing Corporation, Warren, Mich.

No Drawing. Continuation-in-part of application Ser. No. 61,868, Aug. 6, 1970. This application Feb. 24, 1972, Ser. No. 229,165

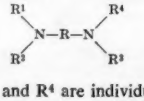
Int. Cl. C07f *1/12*

U.S. Cl. 260—430 **9 Claims**

Disclosed is a gold amine complex useful for the electrodeposition of gold and its alloys. The complex has the formula:

$$Me[AAu(SO_3)_2]_pX_q$$

wherein Me is a mono- or polyvalent cation, A is a polyamine having the formula



wherein R^1, R^2, R^3 and R^4 are individually H or C_1 to C_4 linear or branched monovalent radicals substituted or not with —OH, —CO or —COOH; or R^1 and R^4 taken together, or R^2 and R^3 taken together are divalent C_2 to C_6 alkylene or alkenylene radicals substituted or not with —OH, —CO or —COOH; R is a C_2 to C_6 alkylene or alkenylene radical substituted or not with —OH, —CO, —COOH, or is part of an aromatic ring, or is a radical of the formula

$$—(CH_2—CH_2—NR^5)_mCH_2CH_2—$$

wherein m is the integer 1, 2 or 3, and R^5 is H or a C_1 to C_4 linear or branched monovalent radical substituted or not with —OH, —CO or —COOH, X is an anion; p is 1, 2, or 3; and q is 0, 1, or 2, the sum of $p+q$ being equal to the valence of Me.

3,787,464

PROCESS FOR THE PREPARATION OF TRIVALENT COBALT COMPLEXES

Carlo Neri and Emilio Perrotti, San Donato, Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

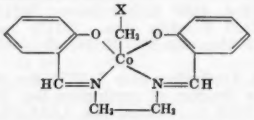
No Drawing. Filed Dec. 30, 1970, Ser. No. 102,975

Claims priority, application Italy, Dec. 30, 1969, 26,425/69

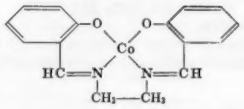
Int. Cl. C07c *11/26*

U.S. Cl. 260—439 R **5 Claims**

A process is disclosed for preparing trivalent cobalt derivatives of the formula



wherein X is NO_2, CN, CH_3CO or CHO which comprises reacting a suspension or solution containing a divalent cobalt complex of the formula



methanol and a reactant of the formula CH_3—X wherein, X is as defined above, at a temperature from 0° C. to 80° C. while simultaneously introducing oxygen gas into said suspension or solution.

3,787,465

ESTERS OF PENTAERYTHRITOL AND PROCESS FOR PREPARING

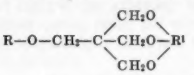
Travis E. Stevens, Huntsville, Ala., assignor to Rohm & Haas Company, Philadelphia, Pa.

No Drawing. Filed May 5, 1960, Ser. No. 27,217

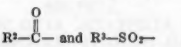
Int. Cl. C07d *105/06*

U.S. Cl. 260—440 **6 Claims**

1. Pentaerythritol compounds of the formula

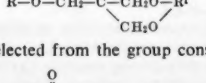


in which R is selected from the group consisting of



in which R^2 is selected from the group consisting of alkyl, aryl and alkenyl and R^3 is aryl and R^1 is arsenic.

4. A process for the preparation of pentaerythritol compounds of the formula



in which R is selected from the group consisting of

in which R^2 is selected from the group consisting of alkyl, aryl, and alkenyl and R^3 is aryl and R^1 is selected from the group consisting of arsenic and

in which R^4 is selected from the group consisting of alkyl and aryl which comprises reacting pentaerythritol arsenite with a compound selected from the group consisting of R^2COCl, $(R^2CO)_2O$, and R^3SO_2Cl in which compounds R^2 and R^3 are as defined hereinbefore at a temperature in the range 0 to 100° C.

3,787,466
N-ACETYL-L-GLUTAMINE ALUMINUM SALT

Tsuneo Kagawa, Tokyo, Kyoichi Fuji, Sakai, and Masao Tanaka and Hiroshi Tanaka, Sunto, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Filed June 2, 1971, Ser. No. 149,336
Claims priority, application Japan, June 5, 1970, 45/48,031
Int. Cl. C07f *5/06*
U.S. Cl. 260—448 R **3 Claims**

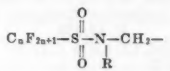
Aluminum salts of N-acetyl-L-glutamine are prepared by reacting N-acetyl-L-glutamine with an aluminum alkoxide in water. The aluminum salts are useful in the treatment of gastric ulcers.

3,787,467
PERFLUORO - ALKANE - SULPHONAMIDO SUBSTITUTED ORGANO-SILICON COMPOUNDS AND THEIR PRODUCTION

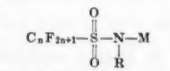
Hans Joachim Lucking, Bergisch-Neukirchen, Walter Noll, Opladen, Werner Buchner, Leichlingen, Klaus Friederich, Leverkusen, and Hans Niederprum, Monheim, Rhineland, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 25, 1972, Ser. No. 220,689
Claims priority, application Germany, Jan. 18, 1971, P 21 07 758.7
Int. Cl. C07f *7/18*
U.S. Cl. 260—448.8 R **4 Claims**

Novel organo-oxysilanes and organo-polysiloxanes having at least one Si-bonded substituent of the general formula



wherein *n* is an integer from 1 to 18 and R is a hydrogen atom or a hydrocarbon radical are produced by reacting a halomethyl organo-oxy silane or a halomethyl-substituted organo-polysiloxane with a perfluoro-alkane-sulphonamide of the general formula



in which M is a hydrogen atom or an alkali metal atom, at a temperature of between 20 and 200° C., and in the case where M is a hydrogen atom in the presence of a tertiary nitrogen base.

The products are suitable as oil-, dirt- and water-repellent coating agents.

3,787,468
METHANATION OF CARBON MONOXIDE AND CARBON DIOXIDE

Donald Kingsley Fleming, Park Ridge, Sarabjit Singh Randhava, Evanston, and Elias Humberto Camara, Hickory Hills, Ill., assignors to Institute of Gas Technology

Filed Sept. 1, 1970, Ser. No. 68,632
Int. Cl. C07c *1/02, 1/04, 1/12*
U.S. Cl. 260—449 M **6 Claims**

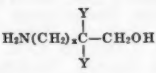
Process of preferential, selective and sequential methanation for reaction of gases containing CO, and/or CO_2 in the presence of hydrogen, using catalysts of Rh and Ru metals, and alloys thereof with Pt, beneficiated with admixtures of tungsten oxide. Precise control of the product gas composition is obtained by predetermined control of process parameters of input gas flow rate and temperature conditions in the methanation reactor. Product gas containing substantially no CO is useful in ammonia synthesis and fuel cells.

3,787,469
POLYISOCYANATE ADDUCTS

Burns Davis and Charles J. Kibler, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 27, 1972, Ser. No. 248,062
Int. Cl. C07c *119/04*
U.S. Cl. 260—453 A **4 Claims**

Polyisocyanate adducts of 1,3- and 1,4-cyclohexanebis-(methylisocyanate) and an aminoalcohol having the structure



where X is 0 or 1 to 8 and Y is alkyl containing 1 to 4 carbon atoms. These polyisocyanate adducts are useful in the preparation of polyurethane coatings, adhesives, foams and elastomers.

3,787,470
PREPARATION OF THIOLHYDROXAMATE ESTERS FROM NITROALKANES

James B. Buchanan, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of abandoned application Ser. No. 702,084, Jan. 31, 1968, which is a continuation-in-part of abandoned application Ser. No. 626,469, Mar. 28, 1967. This application June 29, 1970, Ser. No. 50,898
Int. Cl. C07c *119/18*
U.S. Cl. 260—453 R **9 Claims**

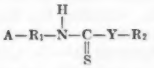
Thiolhydroxamate esters such as methyl thiolacetohydroxamate are prepared by reaction of a nitroalkane such as nitroethane with an alkyl mercaptan such as methyl mercaptan in the presence of a potassium base and a lower alkanol diluent at a temperature of between 40° C. and 120° C.

3,787,471
DITHIO- AND THIONO-CARBAMATE MINERAL VALUE COLLECTORS

Guy H. Harris, Concord, Calif., and Terry D. Filer, Idaho Falls, Idaho, assignors to The Dow Chemical Company, Midland, Mich.

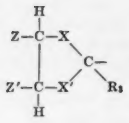
No Drawing. Original application Feb. 13, 1969, Ser. No. 799,071, now Patent No. 3,590,997. Divided and this application Mar. 4, 1971, Ser. No. 121,212
Int. Cl. C07c *155/08*
U.S. Cl. 260—455 A **8 Claims**

A new composition of matter and an improvement in the concentration of ores by flotation which comprises subjecting a sulfide ore in the form of a pulp to a flotation process in the presence of an effective quantity of a flotation collector comprising a new composition of matter corresponding to the formula



wherein A is a radical corresponding to the formula

or



X and Y consist of —S— or —O—; R, R', Z, Z' and R_2 are hydrocarbyl groups, R_1 is an alkylene group and R_3 is H or a lower alkyl group. Certain of the indicated compounds provide for enhanced selectivity and/or recovery of sulfide minerals of Cu, Zn, Mo, Co, Ni and Pb over iron sulfide.

3,787,472

PROCESS FOR THE PRODUCTION OF ALKYL ISOTHIOCYANIC ACID ESTERS

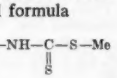
Gunter Giesselmann, Heusenstamm, Werner Schwarze, Frankfurt, and Wolfgang Weigert, Offenbach, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed Jan. 28, 1972, Ser. No. 221,802
Claims priority, application Germany, Feb. 5, 1971, P 21 05 473.9
Int. Cl. C07c *161/04*
U.S. Cl. 260—454 **13 Claims**

Process for the production of an alkyl isothiocyanic acid ester of the general formula

$$R—N=C=S \qquad (I)$$

in which R is a straight or branched alkyl radical having about 1–6 carbon atoms, said process comprising reacting an aqueous solution of about one mole of a dithiocarbamate of the general formula



(II)

in which Me is an NH_4 group, an alkyl ammonium group, an alkaline earth metal atom, or an alkali metal atom, with at least one mole of an aqueous hydrogen peroxide solution, said reaction conducted at about 50°–120° C., and at a pH of about 5–9, and isolating the resulting isothiocyanic acid ester. The esters are useful as intermediate in the preparation of other compounds and are biologically active.

3,787,473

THIOETHER SUBSTITUTED THIOLCARBONATES

Arnoldus van der Heijden and Leonard Schutte, Zevenaar, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Dec. 3, 1971, Ser. No. 204,692
Claims priority, application Great Britain, Dec. 7, 1970, 57,986/70
Int. Cl. C07c *154/00*
U.S. Cl. 260—455 B **1 Claim**

Foodstuffs with improved flavor properties are obtained by incorporation of a diester of monothiocarbonic acid containing radicals characteristic of a flavoring thiol, a secondary or tertiary alcohol and carbonic acid.

These diesters were found to be excellent precursors of flavoring thiols, releasing the thiols at a controlled rate under mild conditions. Particularly suitable diesters have the general formula $R^1—S—CO—O—R^2$, in which

R^1 represents an optionally substituted alkyl, homo- or heterocyclic radical which contains 1–10, preferably 3–7 carbon atoms and not more than 2 hetero atoms which are either oxygen or sulphur and

R^2 represents a secondary or tertiary hydrocarbyl group containing 3–20 carbon atoms, preferably an alkyl group containing 3–8 carbon atoms.

3,787,474

CROSS-LINKED POLYMERS

Peter Daniels, Sawbridgeworth, and Alexander Kennedy Sim, Falkirk, Scotland, assignors to Inveresk Research International, Musselburgh, Scotland

No Drawing. Filed Sept. 10, 1970, Ser. No. 71,274
Claims priority, application Scotland, Sept. 12, 1969, 45,168/69
Int. Cl. C07c *69/54, 141/02*
U.S. Cl. 260—459 **8 Claims**

The invention relates to novel cross-linked polymers which, when administered to humans have the property of lowering and controlling the cholesterol level of the blood. The invention provides novel polymers which are derived from a polymerizable monomer containing a quaternary ammonium group cross-linked with a polyfunctional monomer containing two or more unsaturated groups.

3,787,475

PROCESS FOR MAKING ARYLOXY DERIVATIVES OF AROMATIC DIESTERS AND DINITRILES

Darrell R. Heath and Joseph G. Wirth, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed Jan. 20, 1971, Ser. No. 108,151
Int. Cl. C07c *69/84, 121/74*
U.S. Cl. 260—465 F **11 Claims**

Aryloxy derivatives of aromatic diesters and dinitriles are prepared from reaction of a nitro-substituted phenyl diacid ester or a nitro-substituted phenyl dinitrile with a metal salt of monovalent or divalent aryloxy radicals in the presence of a dipolar aprotic solvent. The invention also includes novel compositions of matter of a difunctional nature prepared in accordance with the above-described process.

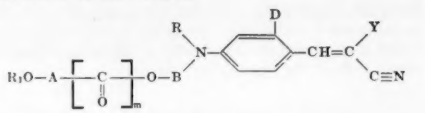
3,787,476

STYRYL DYESTUFFS

Ernst-Heinrich Rohe and Roderich Raue, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

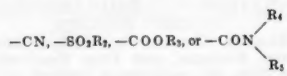
No Drawing. Filed Jan. 6, 1966, Ser. No. 518,981
Claims priority, application Germany, Jan. 12, 1965, F 44,930
Int. Cl. C07c *121/70*
U.S. Cl. 260—465 D **6 Claims**

Dyestuffs of the formula



wherein R_1 is alkyl, alkenyl, aralkyl, aryl, cycloalkyl, acyl, or carbalkoxy; *m* is 0 or 1; A is aryl; B is alkylene having 2 to 4 carbon atoms; R is alkyl, aralkyl, or cycloalkyl or

D is hydrogen, alkyl, alkoxy, or halogen; Y is



R_4 and R_5 are hydrogen, alkyl, aralkyl, cycloalkyl, or aryl; and R_2 and R_3 are alkyl, aralkyl, cycloalkyl, or aryl. The dyestuffs are free from sulphonic acid and carboxylic acid groups and are useful for dyeing cellulose triacetate, polyamide, polyester, and polyurethanes.

3,787,477
PREPARATION OF CYANOHYDRINS
Gary J. Matthews, Boulder, Colo., assignor to Syntex Corporation, Panama, Panama
No Drawing. Filed Feb. 18, 1972, Ser. No. 227,605
Int. Cl. C07c *121/74*
U.S. Cl. 260—465 F **8 Claims**

Disclosed is a process for preparing cyanohydrins involving the step of treating an aldehyde with sodium cyanide and acetic acid. The preparation of α-hydroxy-α-phenylacetonitrile from benzaldehyde is illustrated. The products are known and can be converted, for example, to α-aminoacids.

3,787,478
NOVEL N-HALOALKYLATED ANILINES
Ladislav Dolejs, Pavel Beran, Karel Slama, and Frantisek Sorm, Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia
No Drawing. Filed Apr. 21, 1971, Ser. No. 136,221
Claims priority, application Czechoslovakia, May 5, 1970, 3,122/70
Int. Cl. C07c *101/58*
U.S. Cl. 260—471 R **13 Claims**

Novel N-haloalkylated anilines prepared by reaction of N-alkenyl anilines with hydrogen halide useful for the control of insects.

3,787,479
PROCESS FOR THE CONTINUOUS TRANSESTERIFICATION OF DICARBOXYLIC ACID ALKYL ESTERS WITH DIOLS
Wolfgang Grehl, Chur, Grisons, Switzerland, Wolf-Diether Hahn, Frankfurt am Main, Germany, and Bernhard Stoll, Domat-Ems, Grisons, Switzerland, assignors to Inventa A.G. fur Forschung und Patentverwertung, Zurich, Switzerland
Filed May 20, 1970, Ser. No. 47,782
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 P **18 Claims**

Transesterification of alkyl esters of a dicarboxylic acid and a diol aided by a metal salt catalyst wherein the reaction medium is passed through an elongated reaction zone in plug-like flow (little back-mixing of the reaction medium), wherein some of the transesterification product is maintained present at the inlet end of the reaction zone. Thereby inactivation of the catalyst is prevented.

3,787,480
METHOD OF SEPARATING UNREACTED TEREPHTHALIC ACID
Yataro Ichikawa, Michiyuki Tokashiki, and Osamu Kobayashi, Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan
No Drawing. Filed Nov. 2, 1971, Ser. No. 195,033
Claims priority, application Japan, Nov. 4, 1970, 45/96,409; Nov. 9, 1970, 45/98,416
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 PR **8 Claims**

A method of separating unreacted terephthalic acid from a reaction mixture containing bis-(β-hydroxyethyl) terephthalate obtained by the ethylene oxide process which comprises treating the reaction mixture to form a suspension containing molten bis-(β-hydroxyethyl) terephthalate heated at 85° C. to 180° C. and solid unreacted terephthalic acid, in which suspension

(a) The content of unreacted ethylene oxide is less than 2% by weight based on the bis-(β-hydroxyethyl) terephthalate, and

(b) The content of an inert organic liquid medium in the suspension is 1–100% by weight based on the bis-(β-hydroxyethyl) terephthalate; and separating the unreacted terephthalic acid from this suspension. The recovery of the unreacted terephthalic acid is almost 100%.

3,787,481
METHOD FOR THE CONTINUOUS PERFORMANCE OF ESTERIFICATION UNDER THERMAL CONDITIONS
Francesco Siclari, Cesano Maderno, and Franco Magnoni and Sergio Fulmini, Milan, Italy, assignors to Snia Viscosa Societa, Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy
Filed Apr. 7, 1969, Ser. No. 813,914
Claims priority, application Italy, Apr. 11, 1968, 15,145/68, Patent 829,159
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 P **5 Claims**

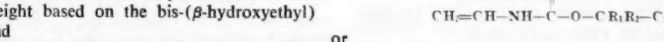
A device for continuously performing chemical processes and reactions which require heat administration from the outside and are conducive to the evolution of volatile by-products, such as the processes leading to the production of spinnable polyesters. The device comprises a reactor having substantially vertical metal walls, means for introducing the reactant and the reacted product which is recycled at the reactor top, centrifuging means for hurling the products introduced at the top of said walls for causing them to descend in the form of a liquid film therealong, and means for recycling a fraction of the product which has been collected at the base of the reactor, towards the top thereof. A chemical process utilizing such a reactor and involving the removal of the by-products, set free in their volatile form at the top of the reactor as they are evolved and set free from said liquid film.

3,787,482
METHOD OF SYNTHESIZING HYDRAZINE COMPOUNDS CARBOXYLIC ACIDS
Frederick C. Bersworth, 120 Washington St., East Orange, N.J. 07017
No Drawing. Continuation-in-part of application Ser. No. 661,204, Aug. 17, 1967, now Patent No. 3,507,892, which is a continuation-in-part of application Ser. No. 580,829, Sept. 20, 1966, now Patent No. 3,351,658, which in turn is a continuation of abandoned application Ser. No. 446,120, Apr. 6, 1965. This application Feb. 20, 1970, Ser. No. 13,189
Int. Cl. C07c *101/26*
U.S. Cl. 260—482 P **2 Claims**

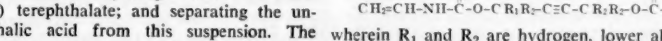
A process for the preparation of hydrazides of amino polycarboxylic acids, particularly dihydrazides, wherein the acid is esterified with a low boiling alcohol in strongly acidic media and the reaction mixture is then made to react with an increased amount of the amino polycarboxylic acid to form a reactive material in solution, whereupon the reaction product ester-acid mixture is reacted with a hydrazine in appropriate molar amount to form mono-, di-, tri-, etc., up to one hydrazide moiety less than the completely converted hydrazide. The carboxylate moieties not converted to hydrazides are converted to hydrazinium salts. The resulting compounds are useful as chelating agents.

3,787,483
VINYL ACETYLENIC CARBAMATES
James T. K. Woo and Dietrich H. Heinert, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Jan. 11, 1971, Ser. No. 105,717
Int. Cl. C07c *125/06*
U.S. Cl. 260—482 B **3 Claims**

Novel carbamates are disclosed having the formula



or



wherein R_1 and R_2 are hydrogen, lower alkyl groups, or R_1 and R_2 are joined to form a cycloalkyl group. The carbamates are useful herbicides and fungicides.

3,787,484

CARBOXYLIC DIESTERS AND THE METHOD FOR PREPARING THE SAME

André Bader and Francis Weiss, Pierre-Benite, France, assignors to Ugine Kuhlmann, Paris, France

No Drawing. Filed Feb. 2, 1968, Ser. No. 702,524

Claims priority, application France, Feb. 8, 1967, 94,173

Int. Cl. C07c *67/00, 69/16, 69/28, 69/52, 69/74, 69/78, 69/80*

U.S. Cl. 260—488 H 9 Claims

Carboxylic diesters of 1,5-hexadiene-1,6-diol such as 1,6-diacetoxy-1,5-hexadiene and 1,6-di-isobutyryloxy-1,5-hexadiene are prepared by heating to a temperature, e.g., 150°–450° C. sufficiently high for a Cope transposition of the corresponding carboxylic diester of 1,5-hexadiene-3,4-diol.

3,787,485

PROCESS FOR PREPARING VINYL ACETATE

Remigio Fernandez, Tenafly, N.J., assignor to Halcon International, Inc.

No Drawing. Filed Dec. 16, 1971, Ser. No. 208,903

Int. Cl. C07c *67/00*

U.S. Cl. 260—491 7 Claims

Process for producing vinyl acetate which comprises subjecting a feed-stock consisting essentially of ethylene glycol diacetate to vapor phase pyrolysis within a pyrolysis zone having surfaces in direct contact with the reaction mixture during the pyrolysis consisting essentially of an austenitic stainless steel.

3,787,486

PREPARATION OF HALOETHANE PHOSPHONIC ACIDS

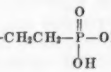
David I. Randall, Calvin Vogel, and Robert W. Wynn, Easton, Pa., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Oct. 17, 1969, Ser. No. 867,357

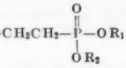
Int. Cl. C07f *9/38*

U.S. Cl. 260—502.4 R 6 Claims

2-haloethylphosphonic acids of the formula:



wherein X is chlorine or bromine, useful as plant growth stimulants, are prepared by hydrolysis of a compound of the formula:



wherein X is as above and R_1 and R_2 are haloalkyl, alkyl or hydroxyalkyl, by treatment with 20–45% aqueous hydrochloric acid under autogenous or greater pressure at a temperature of about 100–145° C.

3,787,487

PREPARATION OF METAL SALT SLURRIES FROM METAL SALT SOLUTIONS

Fred T. Sherk, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed June 25, 1971, Ser. No. 157,748

Int. Cl. C07c *63/14, 63/26*

U.S. Cl. 260—515 P 8 Claims

A water solution of a metal salt of a carboxylic acid is contacted with a liquid dispersant to form a mixture; the mixture is then heated to drive the water substantially therefrom to thereby form a slurry of the solid metal salt in the dispersant.

3,787,488

ACRYLIC COMPOSITIONS

George L. Greenfield, Houston, Tex., assignor to Milchem Incorporated, Houston, Tex.

No Drawing. Filed Apr. 17, 1972, Ser. No. 244,952

Int. Cl. C07c *149/20*

U.S. Cl. 260—537 S 6 Claims

A product of the process for preparing an acrylic composition which is formed from about 80 to 90 parts by weight acrylic acid, about 7 to 15 parts by weight of 2-mercaptoethanol, and about 1.5 to 5 parts by weight ammonium persulfate. The produced material has particular utility as a scale inhibitor in hard water environments.

3,787,489

FLUORINATION PROCESS

Albert Antonini and Robert Putters, Paris, and Georges Wetroff, Le Thillay, France, assignors to Societe Rhone-Progil, Courbevoie, France

No Drawing. Filed May 1, 1972, Ser. No. 249,195

Claims priority, application France, May 6, 1971, 7116334

Int. Cl. C07c *53/18*

U.S. Cl. 260—544 F 11 Claims

A process for the perfluorination of perchloro compounds containing a trichloromethyl and/or pentachloroethyl group by reaction with anhydrous HF in the vapor phase in the presence of a fixed bed catalyst, wherein the perchloro compound and HF are passed through a first reaction zone at an elevated temperature to convert the perchloro compound to at least the corresponding difluoro derivative, the reaction gases are passed to a a second zone to produce a reaction mixture in which the intermediate chlorofluoro compounds contain an average ratio of F atoms to Cl atoms of at least 1.5, and the reaction mixture is passed to a third zone maintained at a higher temperature, with the pressure in each zone being within the range of 1–4 bars and the termperature in each zone being at least 10° C. higher than that in the preceding zone.

3,787,490

METHOD FOR PREPARING SUBSTITUTED DITHIOBIURETS

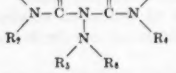
James Zielinski, Kenilworth, N.J., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of applications Ser. No. 732,858, May 29, 1968, and Ser. No. 821,975, May 5, 1969. This application Nov. 5, 1970, Ser. No. 87,301

Int. Cl. C07c *157/02*

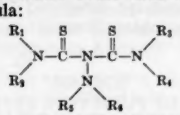
U.S. Cl. 260—552 R 2 Claims

This invention relates to various methods for preparing 1,1,5,5-tetrasubstituted-3-substituted amino dithiobiurets and for preparing other pentasubstituted dithiobiurets. In one embodiment, the method comprises the steps of preparing 1,1,5,5-tetrasubstituted-3-disubstituted amino dithiobiurets characterized by the following formula:



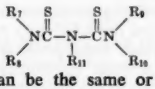
wherein R_1 to R_6 can be hydrogen or C_1–C_3 alkyl, said method comprising the step of reacting an unsymmetrical C_1–C_3 disubstituted hydrazine, said hydrazine being present in excess, with C_1 to C_3 disubstituted thiocarbamoyl chlorides in the presence of water under suitable reaction conditions.

A second embodiment involves preparing 1,1,5,5-tetra-substituted-3-disubstituted amino dithiobiurets characterized by the formula:



wherein R_1–R_8 is a C_1 to C_{10} hydrocarbyl group, said group including (1) saturated or unsaturated acyclic or cyclic, aliphatics such as e.g. ethyl propargyl, cyclohexyl, cyclohexenyl, etc. and (2) aromatic or hetero-aromatic radicals, such as phenyl, pyridyl, etc. said method comprising the step of reacting either a semicarbazide, thiosemicarbazide or an unsymmetrical disubstituted hydrazine with thiocarbamoyl chloride in the presence of a trialkyl amine dissolved in a polar aprotic solvent having a pKa in the range of from 3 to 45.

A third embodiment involves a method for preparing other pentasubstituted dithiobiurets characterized by the following formula:



wherein R_7–R_{11} can be the same or different and are C_1–C_{10} alkyl, C_6–C_{10} cycloalkyl, aralkyl, alkylthioalkyl, alkoxythioalkyl, alkylaminoalkyl and aromatic or heteroaromatic radicals such as phenyl pyridyl, etc. R_7–R_{11} may totally add up to 5 to 50 carbon atoms.

3,787,491

SUBSTITUTED SULFONYL UREA AND ITS STEREOISOMERS

Hermann Bretschneider, 11 Nikodemweg; Klaus Grassmayr, 65 Sistrans, near Innsbruck; and Kraft Hohenlohe-Oehringen, 26 Kartnerstrasse, all of Innsbruck, Austria; and Andre Grussner, 53 Oberer Rheinweg, Basel, Switzerland

No Drawing. Filed Sept. 29, 1971, Ser. No. 184,902
Int. Cl. C07c *127/00*
U.S. Cl. 260—553 D **3 Claims**

A hypoglycemic agent, 1-(p-toluenesulfonyl)-3-(2-hydroxy-3-bornyl)-urea, is prepared, for example, from tosyl ethyl urethane and 3-amino-borneol or 3-amino-isoborneol. One of the isomers, i.e., 1-[(1R)-2-endo-hydroxy-3-endo-bornyl] - 3 - (p-tolylsulfonyl)-urea, is particularly useful as a hypoglycemic agent.

3,787,492

OIL-SOLUBLE CONDENSATION PRODUCTS OF ALPHA-NITRO ALKYL CHLORIDES AND POLYAMINO UREAS, AND THE METHOD OF PREPARING SAME

Richard J. Lee, Downers Grove, Ill., assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Dec. 6, 1971, Ser. No. 205,332
Int. Cl. C07c *127/12*
U.S. Cl. 260—553 R **6 Claims**

Oil-soluble products useful as lubricating oil additives to impart detergency and dispersant properties thereto are prepared by the condensation of alpha-nitro alkyl chlorides, having at least 10 carbon atoms in the alkyl substituent, with polyamino ureas in the molar ratio of from about 1.0:0.5 to about 1.0:1.0, respectively.

3,787,493

PROCESS FOR THE PREPARATION OF 3-CYCLOPENTENE-1,1-DICARBOXAMIDE

Dong H. Kim, Wayne, and Stanley C. Bell, Penn Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Oct. 19, 1971, Ser. No. 190,641
Int. Cl. C07c *103/19*
U.S. Cl. 260—557 R **4 Claims**

A process for the preparation of 3-cyclopentene-1,1-dicarboxamide is described which comprises reacting malonamide with a cis 1,4-dihalo-2-butene in the presence of a strong base.

3,787,494

N-(N,N-DIETHYLENEDIAMINE) SUBSTITUTED AMIDES OF 1 - AMINOCYCLOPENTANECARBOXYLIC ACID

Harvey E. Alburn, 1420 Carroll Brown Way, West Chester, Pa. 19380, and Norman H. Grant, 2 Downs Circle, Wynnewood, Pa. 19096

No Drawing. Filed Dec. 23, 1971, Ser. No. 211,782
Int. Cl. C07c *103/86*
U.S. Cl. 260—557 R **8 Claims**

The compounds are amides of 1-aminocyclopentanecarboxylic acid, having valuable pharmacodynamic properties in that they have both anti-inflammatory and immuno-suppressive activity in warm-blooded animals.

3,787,495

5-(ALPHA-AMINO BENZYL) - 10,11 - DIHYDRO- AND 5H - DIBENZO[a,d]CYCLOHEPTEN-5-OLS AND THE SALTS THEREOF

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Apr. 26, 1972, Ser. No. 247,545
Int. Cl. C07c *87/28*
U.S. Cl. 260—570.5 R **4 Claims**

Substituted benzyl-10,11-dihydro and corresponding 10,11-unsaturated dibenzocycloheptenols, e.g. 5-(α-amino benzyl) - 10,11 - dihydro - 5H-dibenzo[a,d]cycloheptene-5-ol, useful as diuretics, prepared from a series of reactions starting with a dibenzo-cycloheptenone and lithiated N-benzyl benzamides.

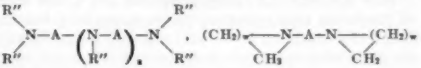
3,787,496

PREPARATION OF AROMATIC COMPOUNDS VIA BENZYNE INTERMEDIATES

Thomas A. Whitney, Linden, and Arthur W. Langer, Jr., Watchung, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed Apr. 29, 1971, Ser. No. 138,766
Int. Cl. C07c *85/04*
U.S. Cl. 260—577 **8 Claims**

A process for synthesizing substituted aromatic compounds characterized by the formula $Ar(ZR_2')_y$, said process comprising reacting a halogenated aromatic compound in the presence of HZR_2' with an alkali metal compound having the formula MZR_2' and a tertiary amine selected from the group consisting of tris-(2-C_1–C_4-dialkylaminoethyl)amine, sparteine, C_1 to C_4-dialkylbispidins, an amine containing bridgehead nitrogen,



and

where M is Li or Na; R' is an inert monovalent radical containing 1 to 20 carbon atoms having a pK_a greater than about 30; Z is an element selected from the group consisting of nitrogen, phosphorus and arsenic, y is an integer of 1 to 6 incuusive; R'' are the same or different C_1–C_4 alkyl radicals; x is an integer from 0 to 3 inclusive; w is an integer from 1 to 5; A is a nonreactive radical selected from the group consisting of (1) cycloaliphatic radicals and their lower alkyl derivatives having ring structures containing from 4 to 7 carbon atoms, wherein said radicals are attached to the nitrogen atoms at 1, 2 or 1, 3 positions on the rings, and (2) 1 to 4 methylenic radicals inclusive, wherein each methylenic radical contains 0 to 2 monovalent hydrocarbon radicals of 1 to 6 carbon atoms; Ar is an aryl group.

3,787,497

METHOD FOR RECOVERING ASHLESS LUBRICATING OIL DISPERSANT

Walter W. Hellmuth and Edward F. Miller, Beacon, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 23, 1971, Ser. No. 211,774

Int. Cl. C07c *85/16*

U.S. Cl. 260—583 N **10 Claims**

Method of recovering polyisobutenyl-substituted polyalkylenepolyamine ashless nitrogen-containing dispersants for lubricating oil compositions employing alcohol extraction.

3,787,498

PROCESS FOR PREPARING 3'-OXO-RETINENE

Jacques Morel, Choisy-le-Roi, France, assignor to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Dec. 29, 1970, Ser. No. 102,557

Claims priority, application France, Dec. 31, 1969, 6945665

Int. Cl. C07c *47/42*

U.S. Cl. 260—586 B **7 Claims**

3'-oxo-retinene, which can be converted into canthaxanthine useful as a coloring agent for foods, is made by oxidizing retinene with a meta-periodate in the presence of, as catalyst, a halogen or a metal oxide of Group V–A, VI–A, VII–A, or VIII of the Periodic Table.

3,787,499

EXTRACTION OF PURE BITTER ACIDS FROM HOPS OR CRUDE HOP EXTRACTS

Herbert L. Grant, Yakima, Wash., assignor to Hops Extract Corporation of America, Yakima, Wash.

Filed Sept. 3, 1971, Ser. No. 177,652

Int. Cl. C07c *45/24*

U.S. Cl. 260—586 R **11 Claims**

A novel process for the extraction of pure alpha acids from hops is described.

3,787,500

DISUBSTITUTED CYCLOPROPENONES AND METHOD OF PRODUCTION

Stephen W. Tobey, Sudbury, Mass., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application May 3, 1968, Ser. No. 726,549, now Patent No. 3,657,348, dated Apr. 18, 1972. Divided and this application Jan. 20, 1972, Ser. No. 219,584

Int. Cl. C07c *49/44*

U.S. Cl. 260—590 **2 Claims**

New disubstituted cyclopropenones and a new method of preparing said cyclopropenones comprising reacting a halocyclopropenium Lewis acid salt with a substituted olefin containing a carbon to carbon double bond wherein one terminal carbon atom of the double bond is sterically accessible to attack by the cyclopropenium ion, and the other terminal carbon atom of the double bond bears substituents contributing to the formation of a stable carbonium ion.

3,787,501

3,5-DISUBSTITUTED-2-HYDROXY-ACETOPHENONES

Andrew G. Kallianos, Albert H. Warfield, and Melvyn I. Simpson, Durham, N.C., assignors to Liggett & Myers Incorporated, New York, N.Y.

No Drawing. Original application Sept. 11, 1969, Ser. No. 857,211, now Patent No. 3,605,760, dated Sept. 20, 1971. Divided and this application Oct. 7, 1970, Ser. No. 78,913

Int. Cl. C07c *49/78*

U.S. Cl. 260—592 **5 Claims**

3,5-disubstituted-2-hydroxyacetophenones, such as 3,5-diisopropyl-2-hydroxyacetophenone, are prepared by the base-catalyzed reaction of a 2,4-disubstituted-2-butenal, e.g., 2,4-diisopropyl-2-butenal, with an ester of acetoacetic acid. The thus-produced substituted 2-hydroxyacetophenones are useful as tobacco flavorants.

3,787,502

METHOD OF PURIFYING PETROLEUM-ORIGIN MERCAPTANS

Antonina Ivanovna Vorobeva, Pervomaiskaya, ulitsa 58, kv. 14, and Vera Mikhailovna Gorina, Kharkovskaya ulitsa 101, kv. 15, both of Ufa, and Roman Dmitrievich Obolentsev, deceased, and Vera Nikolaevna Sedova, Lenina ulitsa 84, kv. 28, Ufa, and Elena Romanovna Obolentseva, Rabochaya ulitsa 41, kv. 1, Saratov, and Natalia Romanovna Popodko, Lenina ulitsa 84, kv. 28, Ufa; said Sedova, Obolentseva, and Popodko also administrators for said Roman Dmitrievich Obolentsev, all of U.S.S.R.

No Drawing. Filed Nov. 18, 1970, Ser. No. 90,866

Int. Cl. C07c *149/04*

U.S. Cl. 260—609 R **5 Claims**

A method of purifying mercaptans isolated from petroleum distillates, from the admixture of the aromatic and acid nature, in which mercaptans are treated with an aqueous alkaline solution to eliminate the acid-nature admixtures, then with an organic solvent inert with respect to mercaptans and selective for the aromatic admixtures to be eliminated. The instant method is instrumental in achieving 99-percent degree of purity of mercaptans. The purified mercaptans are effective substitutes for synthetic mercaptans.

3,787,503

PEROXYGEN COMPOUNDS

Robert C. P. Cubbon, John E. Braid, and Alfred E. Oates, Luton, and Ronald Preston, Dunstable, England, assignors to Laporte Chemicals Limited

No Drawing. Filed Aug. 14, 1967, Ser. No. 660,199

Claims priority, application Great Britain, Aug. 16, 1966, 36,641/66

Int. Cl. C07c *73/06*

U.S. Cl. 260—610 R **13 Claims**

The invention relates to novel ketone peroxides, compositions containing them and processes for producing the peroxides and the compositions. The ketone peroxides are those with an alkoxy or hydroxy substituent in the α,β- or γ-position. The compositions contain (1) the peroxides and (2) water which may be in admixture with a hydrophobic or hydrophilic solvent or (3) a hydrophobic solvent. The peroxides are produced by reacting the α,β- or γ-alkoxy or hydroxy ketone with aqueous hydrogen peroxide and a source of hydrogen ions, for example a mineral acid.

3,787,504

PROCESS FOR PREPARING ORGANIC DIPEROXIDES

Cesare Augusto Peri, Spartaco Fontani, and Franco Ladavas, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Continuation-in-part of abandoned application Ser. No. 507,054, Nov. 9, 1965. This application Dec. 26, 1968, Ser. No. 787,243

Int. Cl. C07c *73/00*

U.S. Cl. 260—610 R **6 Claims**

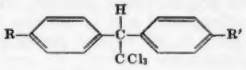
An isomeric mixture of 60–70% of 1,3- and 40–30% of 1,4-isomers of α,α'-bis(di-tert.butylperoxy)diisopropylbenzene is prepared by reacting an isomeric mixture of 60–70% of 1,3- and 40–30% of 1,4-isomer of α,α' dihydroxy - diisopropylbenzene with tert.butylhydroperoxide in the presence of di-tert.butylperoxide solvent and sulfuric acid catalyst.

3,787,505
INSECTICIDAL BIODEGRADABLE ANALOGUES OF DDT

Robert L. Metcalf, Inder Kapoor, and Asha Hirwe, Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

No Drawing. Filed May 26, 1971, Ser. No. 147,247
Int. Cl. C07c *43/20*
U.S. Cl. 260—612 R **4 Claims**

Asymmetrical, biodegradable insecticides having the formula:



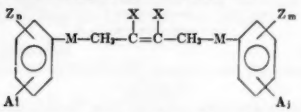
where R and R′ are different and R is selected from the group consisting of $-CH_3$, $-CH_3O$, $-C_2H_5O$, $-C_3H_7O$, and R′ is selected from the group consisting of $-SCH_3$, and $-CH_3$; and methods for providing and selectively controlling the biodegradability of DDT analogue insecticides.

3,787,506
FIRE RETARDANTS FOR POLYMERS

Gary A. Ungefug, R. Garth Pews, and Richard T. Dickerson, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 876,998, Nov. 14, 1969. This application Sept. 4, 1970, Ser. No. 69,927
Int. Cl. C07c *43/20*
U.S. Cl. 260—613 R **11 Claims**

Compounds having the general formula



each X independently, forming either the cis or trans isomer, is F, Cl, Br, I or H where not more than one X is H,
each M independently is O or S,
each Z independently is Cl or Br,
each A independently is an inert substituent, such as F, I, methyl, phenyl, hydroxy, methoxy, nitro, carboxy, acetoxy, cyano, amino or sulfo,
n and *m* are integers of 1 to 5 provided that when $n=m=1$ then each Z and X is Br and M=O and provided that when one X is H then *n* and *m* are integers of 3 to 5, and
i and *j* are integers of 0 to 2 where $i \leq n-1$ and $j \leq m-1$

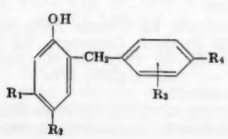
impart excellent fire retarding properties to polystyrene and are stable when extruded or molded with polystyrene at temperatures above 200° C.

3,787,507
HALOGENATED BENZYLPHENOLS HAVING BACTERIOSTATIC ACTIVITY

Jacques Debat, Paris, France, assignor to Institut de Recherches Chimiques et Biologiques Appliquees (I.R.C.E.B.A.), Paris, France

No Drawing. Filed Feb. 5, 1971, Ser. No. 113,057
Claims priority, application France, Feb. 13, 1970, 7005194
Int. Cl. C07c *39/12, 39/24*
U.S. Cl. 260—619 A **6 Claims**

Halogenated benzylphenols of the formula:



in which R_1 is a hydrogen atom when R_2 is a bromine or fluorine atom, or R_1 is a trifluoromethyl group when R_2 is a hydrogen atom; R_2 is a hydrogen or chlorine atom in the 2′-position or 3′-position and R_4 is a chlorine or fluorine atom having bacteriostatic properties. Also disclosed are their use in the treatment of angina and bronchopulmonary and stomatological disorders and a process of preparation of these compounds by the Friedel-Crafts type reaction between the corresponding phenol and substituted benzyl chloride.

3,787,508
SOLID, CURABLE POLYEPOXIDES MODIFIED WITH HYDROLYZED LIQUID POLYEPOXIDES

Eddie Bob Walker, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Oct. 25, 1968, Ser. No. 770,857, now Patent No. 3,632,836. Divided and this application Apr. 1, 1971, Ser. No. 130,540
The portion of the term of the patent subsequent to Oct. 8, 1985, has been disclaimed
Int. Cl. C07c *41/00*
U.S. 260—613 R **3 Claims**

A solid curable polyepoxide is rendered of greater reactivity to curing and esterification, while maintaining its other desirable properties by the addition thereto of minor amounts of hydrolyzed or partially hydrolyzed epoxide product, or by preparing a solid curable polyepoxide from a liquid epoxy resin by reacting the liquid resin with a diphenolic compound and a catalyst in the presence of said hydrolyzed product.

3,787,509
STABILIZATION OF 1,1,1-TRICHLOROETHANE

Herman Richtzenhain, Cologne-Suelz, and Rudolf Stephan, Ranzel Ober Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft Patentabteilung, Troisdorf, Cologne, Germany

No Drawing. Division of application Ser. No. 805,923, Jan. 5, 1969, now Patent No. 3,590,088, which is a division of application Ser. No. 609,681, Jan. 16, 1967, now Patent No. 3,445,532, which in turn is a continuation of application Ser. No. 316,772, Oct. 16, 1963. Divided and this application June 29, 1970, Ser. No. 60,173
Claims priority, application Germany, Oct. 18, 1962, D 40,087
Int. Cl. C07c *17/42, 19/02*
U.S. Cl. 260—652.5 R **1 Claim**

The stabilization of 1,1,1-trichloroethane by admixing such with 0.5 to 10 wt. percent of a mixture of acetonitrile, 1,4-dioxane and ethylenediamine.

3,787,510
MULTIFUNCTIONAL POLYMERIZATION INITIATORS

Ralph C. Farrar, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Original application Feb. 3, 1969, Ser. No. 796,204, now Patent No. 3,644,322, dated Feb. 22, 1972. Divided and this application Aug. 20, 1971, Ser. No. 173,643
Int. Cl. C07f *1/02*
U.S. Cl. 260—665 R **9 Claims**

A multifunctional polymerization initiator prepared in a two-step process by reacting an organomonolithium compound with a polymerizable conjugated diene or polymerizable monovinyl-substituted aromatic compound and then

contacting the reaction mixture with a polyvinyl aromatic compound.

3,787,511

SELECTIVE HYDROGENATION EMPLOYING NICKEL ARSENIDE CATALYST

Marvin M. Johnson, Donald C. Tabler, and Gerhard P. Nowack, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Application June 8, 1970, Ser. No. 44,665, now Patent No. 3,697,448, which is a continuation-in-part of abandoned application Ser. No. 6,971, Jan. 29, 1970. Divided and this application May 2, 1972, Ser. No. 249,726

Int. Cl. C07c *13/02, 13/26*

U.S. Cl. 260—666 A **5 Claims**

A method and catalysts for selective hydrogenation and isomerization which involves contacting a feedstream with hydrogen and with various supported catalysts of metallic arsenides and antimonides, with carbon monoxide being optionally introduced into the reaction as a modifier.

3,787,512

PREPARATION OF AROMATIC HYDROCARBONS

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

No Drawing. Continuation-in-part of application Ser. No. 813,340, Apr. 3, 1969, which is a continuation-in-part of application Ser. No. 598,779, July 29, 1966, both now abandoned. This application Mar. 10, 1971, Ser. No. 123,037

Int. Cl. C07c *15/12*

U.S. Cl. 260—668 C **11 Claims**

Process for alkylating an aromatic hydrocarbon by reacting a haloalkane with either benzene or an alkyl benzene and conducting the reaction in the presence of an alkylaluminum halide catalyst without deliberately adding heat to elevate the temperature of the reaction.

3,787,513

ARYL SUBSTITUTED METHANE COMPOUNDS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed June 9, 1971, Ser. No. 151,587

Int. Cl. C07c *15/12*

U.S. Cl. 260—668 C **7 Claims**

Aryl substituted methane compounds are prepared by contacting an aromatic aldehyde with an aromatic hydrocarbon in the presence of boron trifluoride.

3,787,514

CATALYSTS FOR SELECTIVE HYDROGENATION OF HYDROCARBONS

Philippe Bernusset, Rue Maurice Fournier, Salindres, France

No Drawing. Continuation-in-part of abandoned application Ser. No. 52,727, July 6, 1970. This application July 19, 1972, Ser. No. 273,328

Int. Cl. C07c *11/00*

U.S. Cl. 260—677 H **8 Claims**

The removal of unsaturated impurities in the purification of ethylenic gases by selective hydrogenation with a catalyst of palladium having an addition of vanadium as a promoter.

3,787,515

ISOPRENE POLYMERIZATION INHIBITOR

Boris Nikolaevich Gorbunov, ulitsa Lenina 5, kv. 41, Volgograd, U.S.S.R.; Anatoly Ivanovich Lukashov, prospekt Lenina 32, kv. 20, Volzhsky, U.S.S.R.; and Tamara Ivanovna Mukhortova, ulitsa Borovskogo 2; and Alexandr Pavlovich Khardin, ulitsa Mira 26, kv. 101, both of Volgograd, U.S.S.R.

No Drawing. Filed May 19, 1971, Ser. No. 145,037

Int. Cl. C07c *7/00, 7/18*

U.S. Cl. 260—681.5 **3 Claims**

An isoprene polymerization inhibitor, characterized in that it is o-nitrophenol and is effective in preventing polymer clogging in the column during purification of isoprene by rectification.

3,787,516

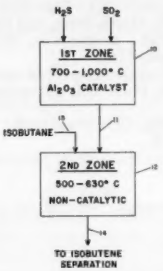
CONVERSION OF ISOBUTANE TO ISOBUTENE

Roger M. Bean, Glen Mills, Pa., assignor to Sun Research and Development Co., Philadelphia, Pa.

Filed Sept. 28, 1972, Ser. No. 293,193

Int. Cl. C07c *5/20*

U.S. Cl. 260—683.3 **7 Claims**



Isobutane is dehydrogenated to produce isobutene by establishing in a first zone a dehydrogenating agent consisting essentially of sulfur at 700–1000° C. and then directly contacting same non-catalytically in a second zone at 500–630° C. with isobutane. Establishment of the dehydrogenating agent can be done either by catalytically reacting SO_2 and H_2S at 700–1000° C. or by heating sulfur to 700–1000° C.

3,787,517

OXIDATIVE DEHYDROGENATION OF PARAFFINS

Werner O. Haag and Joseph N. Miale, Trenton, N.J., assignors to Mobil Oil Corporation

No Drawing. Filed Feb. 9, 1970, Ser. No. 10,023

Int. Cl. C07c *5/18*

U.S. Cl. 260—683.3 **3 Claims**

Organic compounds containing at least one

grouping, e.g. ethylbenzene, are dehydrogenated by reacting with carbonyl sulfide in the vapor phase in the presence of a heavy metal catalyst on a carrier, for example, iron on silica or silica alone.

3,787,518

PLURAL STAGES OF HF ALKYLATION OF ISOPARAFFIN WITH BUTYLENE AND PROPYLENE REACTANTS

Robert F. Anderson, La Grange Park, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

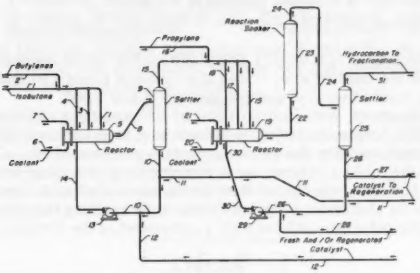
Filed Mar. 20, 1972, Ser. No. 236,049

Int. Cl. C07c *3/54*

U.S. Cl. 260—683.45 **4 Claims**

Plural stages for alkylating an isoparaffin with a butylene reactant and with a propylene reactant utilizing hy-

drogen fluoride catalyst, the butylene reactant is reacted initially with a catalyst containing 70–95 wt. percent HF and the separated hydrocarbon phase is then reacted with the propylene reactant with a catalyst of higher HF concentration than that utilized in the initial reaction. The catalyst in the second reacion contains 80–99 wt. percent HF. An optimum yield of high quality alkylate product is recovered from the butylene and propylene stages of alkylation.



3,787,519

HYDROXYL CONTAINING COPOLYMERS

Joseph A. Vasta, Woodbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

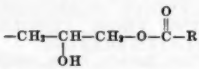
No Drawing. Original application Oct. 8, 1970, Ser. No. 79,348, now Patent No. 3,679,642. Divided and this application May 11, 1972, Ser. No. 252,353

Int. Cl. C08g *45/10*

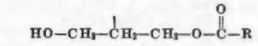
U.S. Cl. 260—834 **8 Claims**

Polymers of ethylenically unsaturated monomers, containing

(A) at least 5% of ethylenically unsaturated carboxylic acid monomer units having active hydrogen atoms replaced with



and/or



radicals, wherein R is a tertiary aliphatic hydrocarbon radical having the structure

where R_1 is $-CH_3$ and R_2 and R_3 are alkyl groups of 1–12 carbon atoms; and

(B) up through 10% of vinyl pyrrolidone units,

and coating compositions containing such polymers.

3,787,520

POWDERED COATING COMPOSITIONS CONTAINING A GLYCIDYL ESTER COPOLYMER, A PHENOLIC HYDROXY CROSSLINKING AGENT, AND A FLOW CONTROL AGENT

Santokh S. Labana, Dearborn Heights, and Ares N. Theodore, Farmington, Mich., assignors to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Aug. 16, 1971, Ser. No. 172,225

Int. Cl. C08g *45/04*

U.S. Cl. 260—836 **22 Claims**

Powder coating compositions are disclosed. In general, individual powder coating compositions are a mixture of the following materials. A copolymer of glycidyl methacrylate and an ethylenically unsaturated compound is formed in such proportions as to obtain a copolymer with a glass transition temperature in the range of 40° C. to 90° C. and a molecular weight ($\overline{M}_n$) in the range of 2500 to 8500. The glycidyl methacrylate is present in the copolymer from at least about 8% by weight to no more than about 30% by weight. Another material of the coating composition is a cross linking agent formed of a phenolic hydroxy terminated resin present in the amount of 0.8 to 1.1 phenolic hydroxy groups for each epoxy group in the copolymer. A third material used in forming the powder coating mixture is a flow control agent which forms at least 0.05% by weight of the mixture. The flow control agent is a polymer having a molecular weight ($\overline{M}_n$) of at least 1000. The flow control agent also has, at the baking temperature of the powder coating composition, a lower surface tension than the surface tension of the copolymer.

3,787,521

METHOD OF PREPARING A POWDER COATING COMPOSITION CONTAINING GLYCIDYL ACRYLATE COPOLYMERS AND DICARBOXYLIC ACID CROSSLINKING AGENT

Santokh S. Labana, Dearborn Heights, and Amos Golovoy, Westland, Mich., assignors to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Feb. 22, 1971, Ser. No. 228,262

Int. Cl. C08g *45/04*

U.S. Cl. 260—836 **4 Claims**

A powder coating composition whose principal ingredients are (a) a copolymer of glycidyl acrylate or glycidyl methacrylate and an ethylenically unsaturated compound, (b) a dicarboxylic acid cross linking agent, and (c) other suitable materials such as a pigment, a flow control agent, a catalyst and such, is manufactured by a process which includes the following general steps. A solution of the copolymer in a solvent is prepared. A solution of the dicarboxylic acid in an alcohol having a boiling point in the range of 60° C. to 120° C. is also prepared. The alcohol acts as a solvent for the acid. The copolymer solution is mixed with the dicarboxylic acid solution to form an intermediate solution. The other suitable materials for the powder coating composition are mixed with the intermediate solution to form a final solution. The solvents are evaporated from the final solution to form the powder coating composition.

3,787,522

ACRYLATE POLYMER PARTICLES COMPRISING A CORE, AN OUTER SHELL, AND AN INTERMEDIATE LAYER

Ray A. Dickie, Birmingham, and Seymour Newman, Southfield, Mich., assignors to Ford Motor Company, Dearborn, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 100,464, Dec. 21, 1970. This application Nov. 1, 1972, Ser. No. 302,700

Int. Cl. C08f *15/18*

U.S. Cl. 260—836 **18 Claims**

Novel thermoplastic materials in particulate form have (1) a core of crosslinked acrylic polymer formed from a major amount of monofunctional, monoacrylate and a crosslinking amount of a di- or tri-functional monomer containing two or more non-conjugated terminal ethylenic groups, (2) a polymeric outer shell formed by polymerizing monomers of methyl methacrylate or a mixture of methyl methacrylate and monomers copolymerizable therewith and (3) an intermediate layer consisting essentially of the copolymerization product of additional monomers of the type used to form the crosslinked acrylic polymer and additional monomers of the type used to form said outer shell. Said intermediate layer is formed by introducing said shell-forming monomers into the polymerization of said core-forming monomers when polymerization of said core-forming monomers is between about 50 and about 90 percent complete. The particles

can be molded so as to form transparent articles of manufacture and the relative proportions of their components can be varied to produce moldings having a wide variety of tensile properties. The particles also have utility as unique modifiers for thermoplastic and thermosetting materials. The outer layer can be prepared so as to provide reactive functional groups on its surfaces.

3,787,523

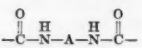
ANTISTATIC POLYAMIDE FIBER CONTAINING SULFONIC ACID POLYETHER REACTION PRODUCT

Lamberto Crescentini and Rodney Lee Wells, Chester, Va., assignors to Allied Chemical Corporation, Morristown, N.J.

No Drawing. Filed Sept. 29, 1972, Ser. No. 293,614
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 PG **10 Claims**

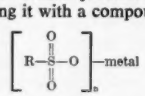
It has been suggested that the antistatic properties of synthetic fibers of polyamide could be improved by dispersing in the polyamide a minor proportion of a chain-extended polymeric reaction product of (1) a high molecular weight polyether compound that is an adduct of an amine having at least one primary group with at least one alkylene oxide having 2 to 4 carbon atoms, with (2) a chain extending compound selected from the group consisting of diepoxides and compounds which yield the following radicals:

and



where A is a divalent radical.

It has now been found that the viscosity of said chain-extended polymeric reaction product can be substantially increased by reacting it with a compound of the formula:



or a compound of the formula:

wherein R is selected from the group consisting of alkyl, cycloalkyl, aryl and arylalkyl, *n* is a whole number corresponding to the valence of the metal, and Z is selected from the group consisting of hydrogen, ammonium cation and substituted ammonium cation. Said higher viscosity is a primary requirement for improved dispersion of the antistatic additive into molten polyamide during spinning of antistatic fiber. Moreover, it has been found that the antistatic properties and dyeability of the polyamide fiber are improved.

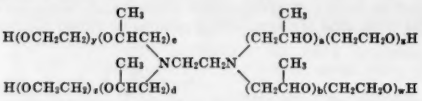
3,787,524

ANTISTATIC POLYAMIDE FIBER CONTAINING SULFONIC ACID POLYETHER REACTION PRODUCT

Lamberto Crescentini and Rodney Lee Wells, Chester, Stanley David Lazarus, Petersburg, and Gene Clyde Weedon, Richmond, Va., assignors to Allied Chemical Corporation, Morristown, N.J.

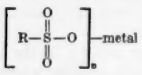
No Drawing. Filed Sept. 29, 1972, Ser. No. 293,613
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 PG **10 Claims**

It has been suggested that the utility of synthetic fibers of polyamide could be increased by dispersing in the polyamide a minor proportion of an antistatic polyether compound derived from the reaction of an amine having at least one primary group with at least one alkylene oxide having 2 to 4 carbon atoms, e.g., a compound represented by the formula :



where *a*, *b*, *c*, *d* *w*, *x*, *y* and *z* are each a whole number and the total of *a*, *b*, *c*, and *d* is between 8 and 850 and the total of *w*, *x*, *y*, and *z* is between 8 and 1,000.

However, with incorporation of this antistatic additive in the polyamide, serious problems have been encountered in melt-spinning due to the frequent occurrence of "drips" of the molten polymer as it emerges from the spinneret. It has now been found that the occurrence of said drips can be eliminated or greatly reduced by reacting the antistatic polyether additive with a compound of the formula:



or a compound of the formula:

wherein R is selected from the group consisting of alkyl, cycloalkyl, aryl and arylalkyl, *n* is a whole number corresponding to the valence of the metal, and Z is selected from the group consisting of hydrogen, ammonium cation and substituted ammonium cation.

Moreover, it has been found that the antistatic properties and dyeability of the resulting polyamide fiber are improved.

3,787,525

MANUFACTURE OF POLYURETHANE POWDERS USING POLYVINYL PYRROLIDONE HAVING SIDE CHAINS FROM COPOLYMERIZATION WITH ALKYLATED OLEFINS

John J. McGarr, Beverly, Mass., assignor to USM Corporation, Boston, Mass.

No Drawing. Filed Aug. 7, 1972, Ser. No. 278,611
Int. Cl. C08g *41/04*
U.S. Cl. 260—859 R **10 Claims**

Method for preparing polyurethane resins directly in finely divided form by reaction in an inert organic liquid medium of a first reactant, miscible with the organic liquid medium, and a second reactant immiscible and emulsified as fine droplets in a continuous phase of the liquid medium with the aid of special surfactants. The reaction forms a finely divided reaction product insoluble in the liquid medium.

3,787,526

NON-LINEAR POLYESTERS FROM A DICARBOXYLIC ACID, ETHERIFIED DIPHENOL AND AN ALKOXYLATED POLYHYDROXY COMPOUND

Joseph P. Burns, Joseph Feltzin, and Erich Kuehn, Wilmington, Del., assignors to ICI America Inc., Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 97,393, Dec. 11, 1970. This application Oct. 22, 1971, Ser. No. 191,839
Int. Cl. C08g *39/10*
U.S. Cl. 260—860 **18 Claims**

New polyester compositions which contain residues of polyfunctional polyhydroxy materials as chain branching members thereof, solutions of said polyester compositions in unsaturated monomers and the cured product of said solutions are disclosed. The polyester compositions as a class are characteristically tough and have liquid and tack points within a specific temperature range.

3,787,527

PROCESS FOR THE SETTING OF UNSATURATED POLYESTER RESINS

Heinz Meyer, Munich, Dieter Schmid, Pullach, near Munich, Hans Schwarzer, Krailling, and Hans Joachim Twittenhoff, Strasslach, Germany, assignors to Electrochemische Werke Munich AG, Hollriegelskreut, near Munich, Germany

No Drawing. Original application June 2, 1969, Ser. No. 829,766, now abandoned. Divided and this application Oct. 14, 1971, Ser. No. 189,408

Int. Cl. C08f *21/02*

U.S. Cl. 260—861 **7 Claims**

Process for setting unsaturated polyester resins which comprises contacting such a polyester resin with a mixture of a perester and a tertiary hydroperoxide as setting catalyst, the weight ratio of the perester to said tertiary hydroperoxide being from 90:10 to 10:90.

3,787,528

NOVEL FLAME RETARDANT COMPOSITIONS

Isaac Benghiat, Mentor, Ohio, assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 888,965, Dec. 29, 1969, now Patent No. 3,691,275, dated Sept. 12, 1972. This application June 5, 1972, Ser. No. 263,357

Int. Cl. C09k *3/28*

U.S. Cl. 260—865 **9 Claims**

Novel flame retardant compositions of matter comprising a mixture of a polymer and diester of a polyhalo-substituted alkylphosphonate containing dissimilar halogen atoms as exemplified by polypropylene and dimethyl 3-chloro-2,3-dibromopropylphosphonate will possess useful and desirable physical characteristics of flame retardancy or fire resistance.

3,787,529

NOVEL FLAME RETARDANT COMPOSITIONS

Isaac Benghiat, Mentor, Ohio, assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 888,966, Dec. 29, 1969, now Patent No. 3,700,760. This application June 5, 1972, Ser. No. 263,358

Int. Cl. C09k *3/28*

U.S. Cl. 260—865 **11 Claims**

Novel flame retardant compositions of matter which comprise a mixture of a polymer and a diester of a halo-substituted alkyloxyalkylphosphonate containing at least two halogen atoms as exemplified by polypropylene and dimethyl 3-chloro-2,3-dibromopropoxymethylphosphonate will possess useful and desirable physical characteristics of flame retardancy and fire resistance.

3,787,530

CRYSTAL-CLEAR THERMOPLASTIC MOULDING COMPOSITIONS OF LINEAR POLYESTER AND STYRENE-ACRYLONITRILIC COPOLYMER MIXTURES

Lothar Bohn, Glashutten, Taunus, Harald Cherdron, Naurod, Taunus, Manfred Fleissner, Niederhochstadt, Taunus, and Walter Herwig, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Feb. 28, 1972, Ser. No. 230,097

Claims priority, application Germany, Mar. 1, 1971, P 21 09 560.3

Int. Cl. C08g *39/10*

U.S. Cl. 260—873 **10 Claims**

Crystal-clear thermoplastic moulding compositions consisting of a mixture of linear saturated polyesters, the diol component of which consists of ethylene glycol and a diol of the formula $HO—CH_2—CR_1R_2—CH_2—OH$, wherein R_1 represents a hydrogen atom or a linear or branched aliphatic radical having up to 4 carbon atoms, and R_2 represents a linear or branched aliphatic radical having up to 4 carbon atoms, and of a styrene/acrylonitrile copolymer. From these crystal-clear thermoplastic moulding compositions, shaped articles having a high transparency and a high gloss can be manufactured, in particular according to the injection-moulding process. Owing to their good mould release properties, their excellent dimensional stability, as well as their high impact strength, together with favourable hardness values, the moulding compositions are particularly suitable for the manufacture of high-quality shaped articles.

3,787,531

PRESSURE-SENSITIVE ADHESIVES COMPRISING A BLOCK COPOLYMER AND A TACKIFIER

Carl A. Dahlquist, Roseville, and Vasant V. Kolpe, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 813,735, Apr. 4, 1969. This application May 24, 1971, Ser. No. 146,473

Int. Cl. C08f *41/12*

U.S. Cl. 260—876 B **12 Claims**

Normally tacky pressure-sensitive adhesives and adhesive tapes having excellent shear strength and creep resistance, particularly at elevated temperatures, together with good peel strength and tack properties, are obtained by combining tackifying resin with low molecular weight A–B block copolymer. The copolymer A block is normally glassy and has a glass transition temperature above 75° C. while the copolymer B block is amorphous and elastomeric at temperatures above —20° C. Shear strength of the adhesive may be increased by addition of block copolymers containing three or more blocks.

3,787,532

POLYPHENYLENE ETHER COMPOSITIONS

Donald D. Carmelite, Slingerland, N.Y., Morton Kramer, Pittsfield, Mass., and Gim F. Lee, Jr., Albany, N.Y., assignors to General Electric Company

No Drawing. Filed Dec. 3, 1971, Ser. No. 204,719

Int. Cl. C08c *9/14;* C08d *9/08*

U.S. Cl. 260—876 R **17 Claims**

There are provided high impact strength thermoplastic compositions comprising in combination (a) a polyphenylene ether resin, (b) a polystyrene resin and (c) an interpolymer of 30 to 70 parts by weight of a diene rubber with 70 to 30 parts by weight of (i) a vinyl aromatic compound or (ii) a mixture of a vinyl aromatic compound and an acrylic ester, the compositions having a dispersed elastomeric phase with at least 85% of the number of particles being about 0.5 micron or less in size and less than 15% of the number of particles being greater than about 0.5 micron in size. The compositions provide molded articles with substantial and unexpected improvements in impact resistance—especially at low temperatures—and enhanced surface appearance.

3,787,533

N-SECONDARY-ALKYL ALKYLENE DIAMINE SALTS OF PHOSPHATE ESTER ACIDS

Arthur Lee Larsen, Denver, Colo., assignor to Marathon Oil Company, Findlay, Ohio

No Drawing. Continuation-in-part of application Ser. No. 190,266, Oct. 18, 1971. This application Jan. 3, 1972, Ser. No. 215,094

Int. Cl. C02b *5/06;* C07f *9/08*

U.S. Cl. 260—924 **13 Claims**

A composition useful as a corrosion and scale inhibitor is obtained by reacting a N-secondary alkyl alkylene diamine (e.g. contains an average of 8–20 carbon atoms in the akyl group and about 2–4 carbon atoms in the alkylene group) and a phosphate ester, obtained for example by reacting about equal molar amounts of poly-

phosphoric acid and a condensation product of an aliphatic primary alcohol (preferably contains 3–6 carbon atoms) and at least one mole (preferably 1–10 moles) of an alkylene oxide (preferably ethylene oxide). Final reaction product can have a pH of 5–9.

3,787,534
PHOSPHATED MIXED ESTERS OF HYDROXY AMINES

James R. Stanford, Sugar Land, and Paul G. Vogelsang, Jr., Houston, Tex., assignors to Nalco Chemical Company, Chicago, Ill.

No Drawing. Continuation of abandoned application Ser. No. 796,183, Feb. 3, 1969, which is a division of application Ser. No. 600,354, Dec. 9, 1966, now Patent No. 3,477,956. This application Sept. 15, 1971, Ser. No. 180,865

Int. Cl. C02b *3/06;* **C07f** *9/08*

U.S. Cl. 260—928 **4 Claims**

Phosphated hydroxy amines obtained by reacting polyphosphoric acid or phosphorus pentoxide with hydroxyamines, e.g., diethanolamine or triethanolamine, with or without neutralization, are used as scale inhibitors in brines, especially in oil wells, where calcium and barium salts are present.

3,787,535
O-ALKYL(ALKENYL)-N-MONOALKYL(ALKENYL)-S - [N' - MONOALKYL (ALKENYL)-CARBAMYLMETHYL] - THIONOTHIOLPHOSPHORIC ACID ESTER AMIDES

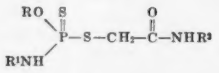
Claus Stölzer, Wuppertal-Vohwinkel, Ingeborg Hammann, Cologne, and Günter Unterstenhofer and Bernhard Homeyer, Opladen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed July 8, 1971, Ser. No. 160,963
Claims priority, application Germany, July 11, 1970, P 20 34 482.5

Int. Cl. A01n *9/36;* **C07f** *9/24*

U.S. Cl. 260—943 **9 Claims**

O-alkyl(alkenyl)-N-monoalkyl(alkenyl)-S-[N' - monoalkyl(alkenyl) - carbamylmethyl] - thionothiolphosphoric acid ester amides of the general formula



(I)

in which

R and R^2 each is an alkyl or alkenyl radical with up to 6 carbon atoms, and

R^1 is a methyl, ethyl, isopropyl or an alkenyl radical with up to 4 carbon atoms,

which possess nematocidal, insecticidal and acaricidal properties.

3,787,536
3-PHOSPHORYLTHIO ACRYLAMIDES

Horst O. Bayer, Levittown, and William S. Hurt and Harold E. Aller, Norristown, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 162,010, July 12, 1971, which is a continuation-in-part of application Ser. No. 22,660, Mar. 25, 1970, which in turn is a continuation-in-part of application Ser. No. 807,445, Mar. 14, 1969, both now abandoned. This application Dec. 21, 1971, Ser. No. 210,619

Int. Cl. A01n *9/36;* **C07f** *9/16*

U.S. Cl. 260—943 **11 Claims**

New compounds belonging to the general class of 3-phosphorylthio acrylamides. They can be prepared by reaction of a phosphorous acid derivative with an isothiazolone hydrochloride. They are broad spectrum insecticides, miticides and nematocides.

3,787,537
TRI(ISOPROPYL)PHENYL PHOSPHATES

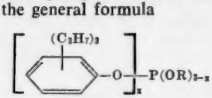
Michel De Marcq, Lyon, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

No Drawing. Filed Aug. 2, 1971, Ser. No. 168,418
Claims priority, application France, July 5, 1970, 7026375

Int. Cl. C07f *9/08, 9/18*

U.S. Cl. 260—954 **10 Claims**

Hydrolysis stable phosphorous esters are disclosed corresponding to the general formula



(I)

wherein the group C_3H_7 is an isopropyl radical, x is the integer 1,2 or 3 and R is an aryl or alkaryl radical containing from 6 to about 30 carbon atoms or an aliphatic, cycloaliphatic or arylaliphatic radical containing from 2 to about 30 carbon atoms and from 0 to 2 chlorine atoms, 0 or 1 bromine atom and 0 to 6 oxygen atoms. Compositions of matter comprising the phosphorous esters (I) containing less than about 5% by weight of amines having boiling points greater than about 150° C. and processes for preparing the phosphorous esters (I) are also disclosed.

3,787,538
PHOSPHORO-AMIDO-THIOATES

Gerhard Schrader, Wuppertal-Cronenberg, and Ludwig Eue and Helmuth Hack, Cologne, Germany, and Seiichi Hirane, Masahiro Aya, Shigeo Kishino, and Nobuo Fukazawa, Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 9, 1970, Ser. No. 10,052
Claims priority, application Japan, Feb. 8, 1969, 44/9,106
The portion of the term of the patent subsequent to Jan. 18, 1989, has been disclaimed

Int. Cl. A01n *9/36;* **C07f** *9/24*

U.S. Cl. 260—954 **16 Claims**

Phosphoro-amido-thioates, i.e. O-alkyl-O-[2-nitro-4-(alkyl, alkoxy and chloro)-phenyl]-N-alkyl-phosphoro-amido-thioates and O-alkyl-O-[2-nitro-4-(optionally alkyl, alkoxy and chloro) - phenyl] - N-cycloalkyl-phosphoro-amido-thioates, or O-alkyl-O-[2-nitro-4-(alkyl, alkoxy and chloro)-phenyl]-N-alkyl-amido-thionophosphates and O-alkyl-O-[2-nitro-4-(optionally alkyl, alkoxy and chloro)-phenyl]-N - cycloalkyl - amido - thionophosphates, which possess herbicidal properties and which may be produced by conventional methods.

3,787,539
THIONOTHIOLPHOSPHORIC ACID O,S-DIESTER AMIDES

Reimer Colln, Wuppertal-Elberfeld, Ingeborg Hammann, Cologne, Gunter Unterstenhafer, Opladen, and Wolfgang Behrenz, Cologne-Stammheim, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Original application Aug. 1, 1969, Ser. No. 846,939, now abandoned. Divided and this application Dec. 8, 1971, Ser. No. 206,179

Int. Cl. A01n *9/36;* **C07f** *9/16, 9/24*

U.S. Cl. 260—959 **8 Claims**

Reacting gaseous ammonia, thionothiolphosphoric acid S-ester dichloride and a hydroxy compound;

I.e. gaseous ammonia, thionothiolphosphoric acid-S-(alkyl, alkenyl, haloalkyl, alkoxy-alkyl, alkylmercapto-

akyl, cycloalkyl, phenylalkyl, phenyl and halophenyl)-ester dichloride, especially thionothiolphosphoric acid-S-(alkyl, phenylalkyl, phenyl and chlorophenyl)-ester dichloride, and an alkanol, alkenol, haloalkanol, alkoxy-alkanol, alkylmercapto-alkanol, cycloalkanol, phenylalkanol, phenol or halophenol, especially an alkanol, alkenol, chloroalkanol, alkoxy-alkanol, alkylmercapto-alkanol, cycloalkanol, phenol or chlorophenol;

By introducing gaseous ammonia until saturation into a mixture of such S-ester dichloride and hydroxy compound, at a temperature of about −10 to +20° C., optionally in the presence of an inert organic solvent or diluent;

To form the corresponding thionothiolphosphoric acid O,S-di(alkyl, alkenyl, haloalkyl, alkoxy-alkyl, alkylmercapto-alkyl, cycloalkyl phenylakyl phenyl and/or halophenyl) ester amides some of which are new compounds and all of which possess insecticidal acaricidal and bird and rodent-repellent properties.

3,787,540

BENZYLATION OF DIALKYL PHOSPHITES WITH DITHIOURETHANES

Andreas Schmidt, Reinach, Kurt Schwarzenbach, Aesch, and Heimo Brunetti, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed May 5, 1972, Ser. No. 250,539
Claims priority, application Switzerland, May 12, 1971, 6,972/71
Int. Cl. C07f *9/40*
U.S. Cl. 260—970 **10 Claims**

Esters of p-hydroxybenzylphosphonic acids are prepared by reacting p-hydroxybenzyldithiourethans with esters of phosphonic acids in the presence of a base. The esters of p-hydroxybenzylphosphonic acids are stabilizers for polymers.

3,787,541

GRAPHITIZATION OF MESOPHASE PITCH FIBERS

Lloyd I. Grindstaff, Rte. 7, Box 733, Elizabethton, Tenn. 37643, and Mack P. Whittaker, 1 Woodland Circle, Johnson City, Tenn. 37601

No Drawing. Continuation-in-part of application Ser. No. 84,953, Oct. 28, 1970, which is a division of application Ser. No. 830,931, June 4, 1969, both now abandoned. This application Oct. 26, 1971, Ser. No. 192,639
Int. Cl. C01b *31/07*
U.S. Cl. 264—29 **4 Claims**

Single phase graphite is obtained by extruding mesophase preparing by heating a carbonaceous material such as a hydrocarbon coker feed, coal tar pitch, ethylene tar pitch, etc. at a temperature above 400° C. until at least 75 percent quinoline-insoluble mesophase has been formed, extruding the resultant material at a temperature between the softening point of the mesophase and 700° C. and subsequently carbonizing the formed product by heating it in a non-oxidizing atmosphere to temperatures from about 1000° C. to about 3000° C. High density material can thus be obtained with controlled alignment of the graphitic structure.

3,787,542

PRODUCTION OF EXTRUDED FOAMED SYNTHETIC THERMOPLASTIC POLYMERIC MATERIALS

Brendan Gallagher, Welwyn, and Anthony Graham Marshall Last, Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 14, 1971, Ser. No. 189,135
Int. Cl. B29d *27/00*; **B29h** *7/20*
U.S. Cl. 264—51 **12 Claims**

Producing foamed thermoplastics by extrusion using a liquid/gas 2 component blowing agent system wherein the gaseous component is injected through a flow restricting device across which there is a pressure gradient of at least 100 lbs./in.^{2}.

3,787,543

PROCESS FOR THE PREPARATION OF LOW DENSITY MICROCELLULAR FOAM SHEETS EXHIBITING HIGH WORK-TO-TEAR VALUES

Robert Guy Parrish, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Application Dec. 27, 1968, Ser. No. 797,312, now Patent No. 3,637,458, which is a continuation-in-part of abandoned application Ser. No. 664,781, Aug. 31, 1967. Divided and this application Dec. 23, 1970, Ser. No. 101,144
Int. Cl. B29d *7/02, 27/00*
U.S. Cl. 264—53 **15 Claims**

A low density foam sheet of a high work-to-break value thermoplastic crystalline polymer comprising polyhedral shaped closed cells having a median diameter of at least 500 microns and a process for its preparation by flash extrusion with reduced bubble nuclei formation.

3,787,544

METHOD OF MAKING PLASTIC ARTICLES WITH A PARTIALLY ENVELOPED CORE

Stanley Ronald Barnette, 90 Cherokee St., Miami Springs, Fla.

Continuation of application Ser. No. 484,162, Aug. 23, 1965, which is a division of application Ser. No. 251,432, Jan. 14, 1963, and refiled as a continuation of application Ser. No. 646,435, June 15, 1967, now Patent No. 3,457,133, which in turn is a continuation-in-part of application Ser. No. 808,599, Apr. 24, 1959, now Patent No. 3,072,973. This application June 4, 1970, Ser. No. 41,771
The portion of the term of the patent subsequent to Jan. 15, 1980, has been disclaimed
Int. Cl. B29d *3/00*
U.S. Cl. 264—69 **12 Claims**

A plastic article with a partially enveloped core is made by removably attaching the core to the base of a mold and embedding the core in curable material. A second layer of the material may be introduced after inverting the mold. Orientable material may be dispersed in the curable material.

3,787,545

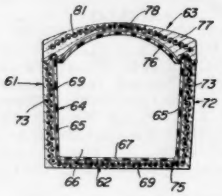
BURIAL VAULTS

Wesley M. Chandler and Paul F. Heuser, St. Paul, and Bernard T. Juba, White Bear Lakes, Minn., assignors to Wilbert, Inc., Broadview, Ill.

Division of application Ser. No. 717,517, Apr. 1, 1968, now Patent No. 3,439,461, and a continuation-in-part of application Ser. No. 513,397, Dec. 13, 1965. This application Oct. 25, 1968, Ser. No. 798,825
Int. Cl. B32b *31/12*
U.S. Cl. 264—135 **1 Claim**

A method for making a composite burial vault comprising an open-topped box like structure and cover therefore wherein preformed liners for each of the box like structure and core are each coated with a wet, tacky adhesive such as epoxy resin. While the epoxy resin is maintained in a wet, tacky state a damp concrete mix is applied directly on the wet, tacky adhesive coating with

the adhesive coating and the concrete component intermingled at their contacting adjacent surfaces and curing



in situ the concrete component and the adhesive coating on each of the box-like structure and cover.

3,787,546

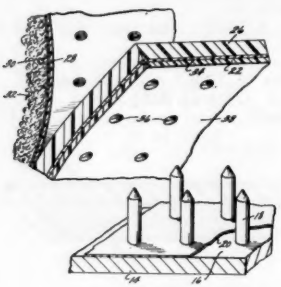
METHOD FOR MAKING A PERFORATED PLASTIC ARTICLE

Richard D. Pratt and Kenneth W. Ewing, Cincinnati, Ohio, assignors to General Electric Company

Filed Dec. 21, 1970, Ser. No. 100,218

Int. Cl. B29h *3/06*

U.S. Cl. 264—156 **3 Claims**



A perforated plastic article such as a perforated reinforced laminated plastic sheet is made on a studded mold by applying pressure to the plastic to press the sheet toward the mold through a pressure transmitting material, for example, hair felt. One form of the method includes making a perforated reinforced plastic composite article having an improved erosion resistant elastomer surface through use of a compatible tack coat such as of the erosion resistant elastomer between a reinforced plastic sheet and the erosion resistant elastomer.

3,787,547

METHOD OF MANUFACTURING A REFORMED PLASTIC ARTICLE

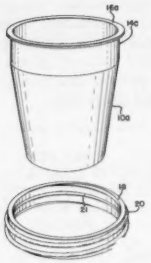
Leslie Stephan Marco, Oaklawn, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 7, 1972, Ser. No. 232,456

Int. Cl. B29c *27/00*

U.S. Cl. 264—249 **4 Claims**

A composite container with a lightweight and relatively thin plastic body portion having an open neck portion around which is fixed a separate and rigid annular ring member with threads or other fastening means for cooperative attachment of a closure member thereto; the container body portion being initially a plastic preform with an outward flange rim at the open end and the annular ring member being assembled with the preform to a position around the neck portion and in engagement with the flange rim; and with the preform then reformed with the body wall expanded beneath the adjacent end of the ring member to trap the same in engagement with the flange rim.



There are conventional plastic glass jars and bottles with relatively thick walls and resultantly of relatively increased weight to provide a threaded finish of sufficient strength to properly secure and seal a threaded cap thereon. Also, there are containers of various types having threaded members of various types separately secured thereto. In some of these types, as where plastic materials are employed, there is a mold formation of the parts with a welding of the materials of the container and threaded members; in others, there is mechanical interlocking between the container and the threaded member.

3,787,548

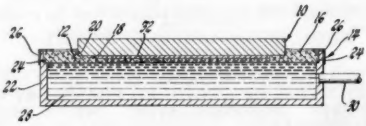
METHOD OF APPLYING PRESSURE SENSITIVE ADHESIVE TO AN ARTICLE

James P. Harris, Troy, and Seymour Katz, Oak Park, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 24, 1970, Ser. No. 101,259

Int. Cl. B29c *1/04*

U.S. Cl. 264—259 **2 Claims**



In a preferred embodiment a uniform film of tacky, pressure sensitive adhesive is applied to an article by employing a special mold having a porous cavity defining member arranged and constructed to receive a predetermined amount of pressure sensitive adhesive and at least the surface of the article to be coated, and a reservoir

beneath the porous member; introducing a liquid into the reservoir in which the pressure sensitive adhesive is insoluble under sufficient pressure to cause the liquid to flow through the porous member and form a liquid film on the cavity surface; placing a predetermined amount of pressure sensitive adhesive in the mold cavity and then placing the article to be coated into the cavity against the adhesive. The adhesive is molded into a thin film against the surface to be coated and adheres thereto but does not stick to the mold because it will not wet the liquid film.

3,787,549

MOULDING PLASTIC ARTICLES

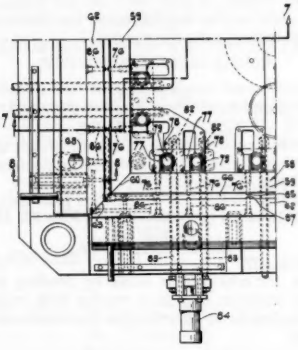
Victor William Stanley Humphrey, Radlett, England, assignor to GKN Sankey Ltd., and Aro Plastic Building Supplies, Ltd., London, England

Filed May 3, 1971, Ser. No. 139,376

Claims priority, application Great Britain, May 5, 1970, 21,517/70

Int. Cl. B29f *1/10*

U.S. Cl. 264—274 **4 Claims**



The specification discloses a method of making an aperture-defining frame member, particularly a window-frame, comprising a rigid frame-shaped reinforcement made of e.g. a solid metal section embedded in synthetic resinous material. The method comprises placing the reinforcement in a mould cavity having the shape of the required frame member and locating the reinforcement in the cavity solely by engaging complementary interfitting formations on the reinforcement and on pin-like projections which extend from the cavity walls, e.g. recesses on the reinforcement engaging the ends of the projections. The longitudinal axes of all the projections are parallel to a predetermined plane and the engagement of the end of each projection with the complementary recess of the reinforcement prevents movement of the latter at least in first directions perpendicular to the plane. The projections are located around the reinforcement to prevent movement of the reinforcement in second directions parallel to the plane. The mould cavity is filled with synthetic resinous material to embed the reinforcement therein while the reinforcement is located in the cavity by the projections, and the cavity is subsequently opened and the projections withdrawn from the completed frame member which is then removed from the cavity.

3,787,550

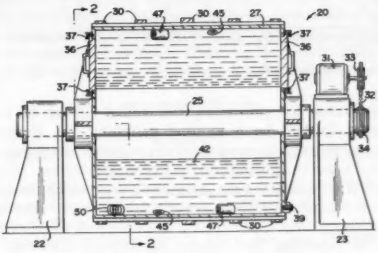
METHOD OF CURING AND/OR SUBJECTING TO PRESSURE AN ELASTOMERIC ARTICLE

Daniel Ross McGillvary, Jackson Township, Stark County, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed July 6, 1971, Ser. No. 159,973

Int. Cl. B29c *25/00*

U.S. Cl. 264—88 **5 Claims**



The invention involves subjecting an article of manufacture to pressure and/or curing conditions by placing it in a stabilizing liquid of approximately the same specific gravity and subjecting the stabilizing liquid to the action of centrifugal force.

3,787,551

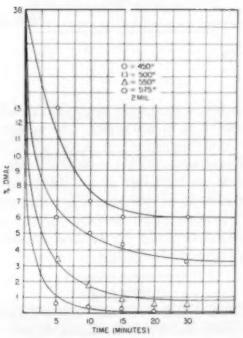
SOLVENT REMOVAL FROM AROMATIC POLYAMIDE FILM

Elliot A. Vogelfanger, Edison, and Richard L. Markham, North Plainfield, N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,666

Int. Cl. B29c *25/00;* B01d *1/22*

U.S. Cl. 264—345 **9 Claims**

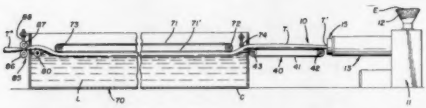


A process for removal of residual organic solvents included in wholly-aromatic polyamide film by subjecting the film containing the residual solvent to a temperature in the range of above the glass transition temperature.

3,787,552
METHOD AND APPARATUS FOR FORMING THINWALLED TUBULAR ARTICLES

Richard R. Spencer, Hot Springs, Ark., and William C. Penny, Alliance, Ohio, assignors to Alliance Rubber Company, Alliance, Ohio

Filed Dec. 21, 1970, Ser. No. 100,038
Int. Cl. B29c *25/00*; B29d *23/04*; B29h *5/28*
U.S. Cl. 264—40 **11 Claims**



Apparatus for producing thinwalled tubing of elastic material formed by a method including, die forming a mass of the elastic material into thinwalled tubing, supplying a pressurizing fluid and a non-adhesive material through a conduit to the interior of the tubing, and passing the tubing through a curing medium while venting the pressurizing fluid in the tubing through both of its extremities to maintain the tubing uniformly expanded and stabilized in the curing medium.

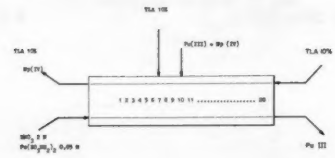
ERRATUM

For Class 423—610 see:
Patent No. 3,787,139

3,787,553
PROCESS FOR THE SEPARATION OF NEPTUNIUM FROM PLUTONIUM BY LIQUID-LIQUID EXTRACTION

Jean Yves Espie, Sceaux, Claude Jouan, Fontenay-aux-Roses, and Gerard Koehly, Maisons-Alfort, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 27, 1971, Ser. No. 147,518
Claims priority, application France, May 28, 1970, 7019504
Int. Cl. C01g *56/00*
U.S. Cl. 423—9 **4 Claims**



The process for separating neptunium and plutonium contained in nitric acid solutions comprises the steps of endowing the starting solution with a reducing action, contacting the solution with an organic phase consisting of trilaurylamine in solution in an inert solvent in order to extract neptunium of valence IV while the plutonium of valence III remains in an aqueous phase, adding capric acid to the loaded organic phase and washing this latter with a reducing aqueous solution.

3,787,554
PROCESS FOR THE SEPARATION OF IRIDIUM AND RHODIUM

Max Ziegler, Gottingen-Herberhausen, Germany, assignor to W. C. Heraeus GmbH, Hanau, Germany

No Drawing. Filed Aug. 2, 1972, Ser. No. 277,209
Claims priority, application Germany, Sept. 3, 1971, P 21 44 151.0
Int. Cl. C01g *55/00*
U.S. Cl. 423—22 **9 Claims**

Iridium is separated from aqueous mineral acid solutions containing iridium and rhodium using an organically substituted ammonium salt and extracting the iridium complex that is formed with an organic solvent. Trialkyl ammonium halides are used to form the iridium complex and aliphatic or aromatic halogenated hydrocarbon, a carboxylic acid ester or a slightly water-soluble alcohol are used to extract the iridium complex.

3,787,555
PROCESS FOR RECOVERING CHROMIUM VALUES FROM CHROME ORE

Charles Patrick Bruen, Bernardsville, N.J., and Christian Albert Wamser, Camillus, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Feb. 16, 1972, Ser. No. 226,931
Int. Cl. C01g *37/14, 49/00*
U.S. Cl. 423—54 **13 Claims**

Chromium values from chrome ore are solubilized in an aqueous solution which comprises digesting the ore with an aqueous chromic acid solution at elevated temperatures to produce a solution of the dichromates of the metal values in the chrome ore, separating the digested solution from the insoluble material, oxidizing the trivalent chromium present in the digested solution to the hexavalent state, and recovering the chrome values. Oxidation of the chrome ore prior to the digestion step sufficient to oxidize at least 40% of the ferrous iron to the ferric state in the ore increases the dissolution rate of the metal values in the chrome ore.

3,787,556
METHOD FOR PREPARING TITANIUM TETRACHLORIDE

Luigi Piccolo and Benedetto Calcagno, Milan, and Marcello Ghirga, Bresso, Italy, assignors to Societa Italiana Resine S.p.A., Milan, Italy

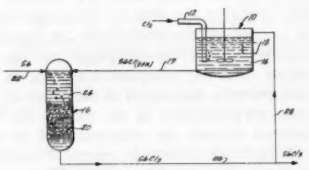
Filed May 11, 1971, Ser. No. 142,326
Claims priority, application Italy, May 12, 1970, 24,458/70
Int. Cl. C01g *23/02*
U.S. Cl. 423—77 **8 Claims**

Titanium tetrachloride is made by feeding powdered ilmenite or titanium slag to a reactor with reagent and heating gas streams of chlorine and the combustion products of coal.

3,787,557
PROCESS FOR MANUFACTURING OF ANTIMONY TRICHLORIDE

Robert D. Stewart, La Habra, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of abandoned application Ser. No. 179,827, Sept. 13, 1971. This application Apr. 16, 1973, Ser. No. 351,372
Int. Cl. C01b *29/00*
U.S. Cl. 423—87 **12 Claims**



There is provided a two-stage process for the production of antimony trichloride from antimony. First, antimony trichloride is reacted with chlorine to form antimony pentachloride in a first reaction zone. Particulate antimony metal and the antimony pentachloride formed

in the first reaction zone are then reacted in a second reaction zone to form antimony trichloride. A portion of the antimony trichloride formed is collected as product and the balance recycled for conversion to antimony pentachloride.

3,787,558

MAGNESIUM HYDROXIDE PRODUCTION

Charles Clifford Briggs, North Anston, and Trevor Wilkinson Lythe, Worksop, England, assignors to Steetley (Mfg.) Ltd., Nottinghamshire, England

No Drawing. Filed Oct. 14, 1970, Ser. No. 80,758
Claims priority, application Great Britain, Oct. 17, 1969, 51,019/69
Int. Cl. C08f *5/22*
U.S. Cl. 423—164 **9 Claims**

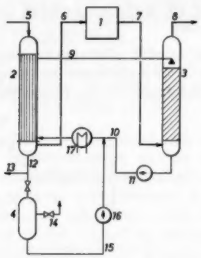
A process for producing magnesium hydroxide having a low boron content from brines or sea water comprising the steps of precipitating magnesium hydroxide from the brine or sea water with alkali and subsequently washing the precipitated magnesium hydroxide with aqueous alkali. The precipitation of the magnesium hydroxide may be carried out in two stages.

3,787,559

DESULFURIZATION OF WATER-CONTAINING HOT COMPRESSED GASES

Paul Rudolph, Bad Homburg, Ernst Kapp, Frankfurt am Main, Georg Kempf, Budesheim, and Wolf-Rudiger Farana, Frankfurt am Main, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Germany

Filed Sept. 22, 1971, Ser. No. 182,807
Claims priority, application Germany, Sept. 23, 1970, P 20 46 753.2; Aug. 20, 1971, P 21 41 878.0
Int. Cl. B01d *53/54*
U.S. Cl. 423—222 **19 Claims**



In the desulfurization of hot water-containing compressed raw gas, such as is produced by distillation of solid or liquid fuels with air or steam, wherein the raw gas is washed with an absorption agent to remove the sulfur therefrom and leave substantially sulfur-free gas, the improvement which comprises cooling the raw gas prior to desulfurization by heat exchange with condensate produced from said raw gas, the heated condensate resulting from said heat exchange being contacted with clean gas leaving said desulfurization so that said condensate is thereby at least partially revaporized. The absorption agent may comprise an aqueous alkaline solution such as alkali arsenite or an alkali salt of an amino acid, or an alkyl- or alkylolamine. Preferably the raw gas is initially cooled to a temperature below that at which it is contacted with the absorption agent.

3,787,560

METHOD OF DECOMPOSING NITROGEN OXIDES

Ruth E. Stephens, Royal Oak, Mich., assignor to Ethyl Corporation, Richmond, Va.

No Drawing. Continuation-in-part of abandoned application Ser. No. 60,650, Aug. 3, 1970, which is a division of abandoned application Ser. No. 692,587, Dec. 22, 1967. This application Jan. 24, 1972, Ser. No. 220,440
Int. Cl. B01d *53/34*
U.S. Cl. 423—239 **6 Claims**

The oxides of nitrogen content of a gas stream can be reduced by contacting the gas stream with a catalyst consisting essentially of neodymium oxide and barium oxide on a suitable support at elevated temperatures. The catalysts are especially useful in reducing the nitric oxide content of the exhaust gas of internal combustion engines.

3,787,561

LOOSELY AGGREGATED 100 MILLIMICRON MICELLULAR SILICA

Ellsworth G. Acker, Baltimore, and Milton E. Winyall, Ellicott City, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed May 5, 1971, Ser. No. 140,569
Int. Cl. C01b *33/12, 33/18*
U.S. Cl. 423—339 **8 Claims**

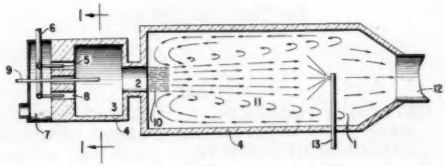
Ultrafine silica materials are produced by first forming a lossely aggregated approximately 100 millimicron micellular silica and fluid energy milling this silica to an ultrafine silica. The loosely aggregated 100 millimicron micellular silica is produced by acid neutralizing a concentrated silicate solution in a two step procedure followed by a hot aging at about 70 to 100° C. for ¼ to 5 hours to yield the silica product. This silica is washed and then may be dried or directly fed to a fluid energy mill for deaggregation and drying to form the ultrafine size silica.

3,787,562

CARBON BLACKS HAVING IMPROVED DISPERSION AND PLATEWEAR CHARACTERISTICS

George L. Heller, Monroe, La., Frank J. Eckert, Morrisville, Pa., and Charles L. De Land, West Monroe, and Robert W. Dingman, Monroe, La., assignors to Cities Service Company, New York, N.Y.

Original application Jan. 2, 1969, Ser. No. 788,491, now Patent No. 3,642,446. Divided and this application May 14, 1971, Ser. No. 143,610
Int. Cl. C09c *1/48, 1/50*
U.S. Cl. 423—445 **2 Claims**



A reaction mixture is formed of a feedstock hydrocarbon and hot combustion gases, the mixture having a composition and sufficient heat content for formation of a carbon black of specific particle size and structure characteristics upon decomposition of the hydrocarbon within the mixture. Before the carbon black is completely formed, the mixture is diluted with a gas which is substantially nonreactive with the carbon black and cooler than the mixture. Agglomeration of the particles of carbon black

within the mixture is reduced, and the resultant dispersion and platewear characteristics of the carbon black in printing inks are greatly improved.

3,787,563

PROCESS FOR PURIFYING SULFURIC ACID FOR THE CATALYTIC SYNTHESIS OF HYDROXYLAMMONIUM SULFATE

Klaus Kartte, Frankenthal, Kurt Jockers and Hermann Meier, Ludwigshafen and Ludwig Taglinger, Gruenstadt, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Mar. 3, 1972, Ser. No. 231,721

Claims Priority, application Germany, Mar. 9, 1971, P 21 11 118.2

Int. Cl. C01b *17/90, 31/02*

U.S. Cl. 423—531 **3 Claims**

Process for the purification of sulfuric acid to be used in the manufacture of hydroxylammonium sulfate by reduction of nitric oxide in contact with platinum catalysts. The process consists in diluting the sulfuric acid with water, adding such an amount of sulfur dioxide that after treatment with activated carbon it still has a content of at least 5 mg. of SO_2 per liter of dilute acid and then treating the sulfuric acid together with air, oxygen or hydrogen peroxide again with activated carbon. The activated carbon can be regenerated by treatment with alkaline substances such as caustic soda solution, aqueous ammonia solution or sodium carbonate solution.

3,787,564

PROCESS FOR PRODUCING FERROMAGNETIC CHROMIUM DIOXIDE

Tatsuji Kitamoto, Mahito Shimizu, and Goro Akashi, Kanagawa, Japan, assignors to Fuji Photo Co., Ltd., Kanagawa, Japan

No Drawing. Filed Dec. 14, 1971, Ser. No. 207,995

Claims priority, application Japan, Dec. 14, 1970, 45/110,489

Int. Cl. C01g *37/02;* **B01j** *1/00*

U.S. Cl. 423—607 **8 Claims**

Ferromagnetic chromium dioxide is produced without adverse affects on its characteristics by using a reaction vessel at least the inner wall of which is chromium.

ERRATUM

For Class 423—339 see:
Patent No. 3,787,501

3,787,565

METHOD OF PRODUCING A DIAGNOSTIC PREPARATION ON THE BASIS OF AN IRON COMPLEX LABELLED WITH 99m Tc

Jean-Paul Nouel, Boisguillaume, and Henry Emile Edouard Renault, Paris, France, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed May 24, 1971, Ser. No. 146,543

Claims priority, application France, May 22, 1970, 7018792

Int. Cl. A61k *27/04*

U.S. Cl. 424—1 **4 Claims**

A method of producing a technetium labelled iron complex in which a solution of a technetium compound is reacted with ferrous ascorbate, the resultant solution is made alkaline and the solution is then agitated in the presence of air until a violet color appears.

3,787,566

DISINFECTING AEROSOL COMPOSITIONS

Claude Gauvreau, Laval, Quebec, Canada, assignor to Holliston Labortories, Inc., Waltham, Mass.

No Drawing. Continuation-in-part of application Ser. No. 854,009, July 29, 1969, now Patent No. 3,595,975, which is a continuation of application Ser. No. 500,225, Oct. 21, 1965, which in turn is a continuation of application Ser. No. 179,778, Mar. 14, 1962, both now abandoned. This application Mar. 29, 1971, Ser. No. 129,254

The portion of the term of the patent subsequent to July 27, 1988, has been disclaimed

Int. Cl. A01n *9/22, 9/24, 9/26*

U.S. Cl. 424—45 **11 Claims**

Disinfecting aerosol compositions comprising pyridinium halide salts admixed with a terpene, together with a propellant in an aerosol container provide effective synergized bacteriostatic action. In particular, effective disinfecting aerosol compositions of both a residual and an air-santizing type are prepared by a sprayable composition comprising cetyl pyridinium bromide, citral and a propellant.

3,787,567

OCTADADECYLAMMONIUM DIETHOXYDITHIOPHOSPHATE USED IN THE TREATMENT OF DERMATOMYCOSES

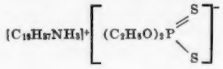
Nikolai Nikolaevich Melnikov, ulitsa D. Ulyanova, 4/3, korpus A, kv. 96; Boris Abramovich Khaskin, Novo-Alexeevskaya ulitsa, 3a, kv. 61; Grigory Nikolaevich Pershin, Novo-Peschanaya, 19, kv. 75; and Sofia Nikolaevna Milovanova, Kutuzovsky prospekt, 5/3, korpus 2, kv. 57, all of Moscow, U.S.S.R.

No Drawing. Filed Sept. 12, 1969, Ser. No. 857,572

Int. Cl. A01n *9/36;* **A61k** *27/00*

U.S. Cl. 424—199 **5 Claims**

A drug for treatment of dermatomycoses whose active ingredient is 1–5% by weight of octadecylammonium diethoxydithiophosphate of the following formula:



3,787,568

ARTHRITIC COMPOSITIONS COMPRISING AN S-(PHOSPHINO- OR PHOSPHITOAUROUS)-THIOURONIUM HALIDE AND METHOD OF PRODUCING ANTI-ARTHRITIC ACTIVITY

Blaine M. Sutton, Hatboro, and Joseph Weinstock, Phoenixville, Pa., assignors to Smithkline Corporation, Philadelphia, Pa.

No Drawing. Filed May 1, 1972, Ser. No. 249,280

Int. Cl. A61k *27/00*

U.S. Cl. 424—211 **17 Claims**

Pharmaceutical compositions having anti-arthritic activity comprising an S-(phosphino- or phosphitoaurous)-thiouronium halide and methods of producing anti-arthritic activity by administering internally, preferably orally, said compositions.

3,787,569
2-p-NITRO- OR p-CHLOROBENZAMIDO-ACETOHYDROXAMIC ACID

Roland N. Johnson and Jon A. Anderson, Norwich, N.Y., assignors to Morton-Norwich Products, Inc.

No Drawing. Original application May 17, 1971, Ser. No. 144,322, now Patent No. 3,728,380. Divided and this application Aug. 14, 1972, Ser. No. 280,563

Int. Cl. A61k *21/00, 27/00*

U.S. Cl. 424—229 **1 Claim**

Novel benzamidoacetohydroxamic acids of the formula:

wherein R is nitro or chloro are potent inhibitors of urease. Combined with urinary tract antibacterials an improvement in the prevention of formation of urinary calculi in the presence of urea splitting organisms is observed.

3,787,570
SUBSTITUTED PHENYLSULFAMYL SALICYLIC ACIDS AND DERIVATIVES THEREOF IN THE TREATMENT OF INFLAMMATION

Tsung-Ying Shen, Bruce E. Witzel, and Gordon L. Walford, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original application June 25, 1969, Ser. No. 836,605, now Patent No. 3,700,773. Divided and this application July 12, 1972, Ser. No. 278,701

Int. Cl. A61k *27/00*

U.S. Cl. 424—233 **2 Claims**

Substituted phenyl sulfamyl or sulfonamido salicylic acids and non-toxic pharmaceutical accepted salts, esters, amides and various derivatives thereof are claimed. Also a method of treating inflammation which comprises administering various substituted phenyl sulfamyl or sulfonamido salicylic acids and the various derivatives are also claimed. The substituted phenyl sulfamyl or sulfonamido salicylic acids described herein have anti-inflammatory, anti-pyretic and analgesic activity.

3,787,571
TRICHLOROETHANOL AND TRIFLUOROETHANOL TOPICAL AND PERCUTANEOUS STEROID ADSORPTION PROMOTERS

Takeru Higuchi, Lawrence, Kan., assignor to Alza Corporation, Palo Alta, Calif.

No Drawing. Filed Nov. 11, 1971, Ser. No. 197,919

Int. Cl. A61k *17/00*

U.S. Cl. 424—239 **3 Claims**

Dermal compositions are disclosed which comprise trichloroethanol or trifluoroethanol as one component of a vehicle having solubilized therein a drug or other beneficial chemical compound. Also disclosed is a method for administering a drug or other beneficial chemical compound to the body which comprises contacting the skin with the drug or compound in the presence of trichloroethanol or trifluoroethanol which acts as an absorption promoter to enhance the topical or percutaneous absorption of the active drug or compound.

3,787,572
N-DISUBSTITUTED 3-AMINO-1,2-BENZISOTHIAZOLES AS ANTIMYCOTIC AGENTS

Horst Böshagen, Haan, Rhineland, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

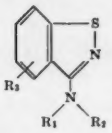
No Drawing. Original application June 26, 1968, Ser. No. 740,020, now abandoned. Divided and this application Sept. 29, 1971, Ser. No. 182,246

Claims priority, application Germany, Mar. 9, 1968, F 53,242

Int. Cl. A61k *27/00*

U.S. Cl. 424—244 **15 Claims**

Compounds and their production are provided wherein the compounds have anti-fungal activity against pathogenic fungi in animals and humans. The compounds are N-disubstituted 3-amino-1,2-benzisothiazoles of the formula:



in which

R_1 and R_2 are each individually aryl, aralkyl or an aliphatic radical, and when each of R_1 and R_2 is alkyl, the two aliphatic radicals together are linked to form a heterocycle with a nitrogen heteroatom, and

R_3 is at least one hydrogen or halogen atom or a lower alkyl or alkoxy group, or nitro.

More generally, the compounds are made up into antimycotic compositions with a suitable carrier or vehicle.

3,787,573
PYRIDINE SULFONIC ACIDS AS DIURETICS

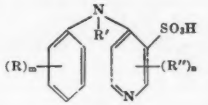
Renat Herbert Mizzoni, 90 Valley Brook Road, Long Valley, N.J. 07853, and Herbert Morton Blatter, 851 Springfield Ave., Apt. 22M, Summit, N.J. 07901

No Drawing. Continuation-in-part of application Ser. No. 20,833, Mar. 18, 1970, now Patent No. 3,674,794, which is a continuation-in-part of abandoned application Ser. No. 876,038, Nov. 12, 1969. This application Aug. 26, 1970, Ser. No. 67,205

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 **3 Claims**

New 4-arylamino-3-pyridinesulfonic acids, e.g. those of the formula



R=H, alkyl, free, esterified or etherified OH, CF_3,NO_2, amino, free of functionally converted carboxy or sulfo;

R′=H, alkyl or acyl;

R″=H or alkyl;

m=1–3;

n=1 or 2;

the N-oxide, esters and salts thereof, and a process for their preparation, are diuretics.

3,787,574
P-AMINOALKYLBENZENESULFONAMIDE DERIVATIVES FOR TREATING DIABETES MELLITUS

Henri Dietrich, Arlesheim, Basel-Land, and Claude Lehmann, Basel, Switzerland, assignors to Ciba-Geigy Corporation

No Drawing. Original application Sept. 11, 1970, Ser. No. 68,794, now Patent No. 3,712,899. Divided and this application Sept. 18, 1972, Ser. No. 290,041

Claims priority, application Switzerland, Sept. 4, 1969, 13,399/69

Int. Cl. A61k *27/00*

U.S. Cl. 424—266 **6 Claims**

Compounds of the class of 1-[p-(carboxamidoalkyl)-phenylsulfonyl]-2-imino-imidazolidines and the pharmaceutically acceptable acid addition salts thereof have hypoglycemic activity; these compounds are active ingredients of pharmaceutical compositions and are useful for the treatment of diabetes mellitus; a typical embodiment is 1-[p-(2-(3-furancarboxamido)-ethyl)-phenylsulfonyl]-2-imino-3-cyclohexyl-imidazolidine.

3,787,575

N-SUBSTITUTED-2-ARYLIMINO-OXAZOLIDINES USED AS ACARICIDES

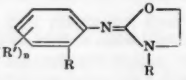
Hartmund Wollweber, Rudolf Hiltmann, and Wilhelm Stendel, Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Original application Dec. 17, 1970, Ser. No. 99,227, now Patent No. 3,686,199, dated Aug. 2, 1972. Divided and this application Jan. 24, 1972, Ser. No. 220,419

Int. Cl. A01n *9/22*

U.S. Cl. 424—272 **8 Claims**

N-substituted-2-arylimino-oxazolidines of the formula



(I)

in which

R denotes a halogen atom, or an optionally halogen-substituted lower alkyl, alkenyl or alkoxy radical,

R′ denotes a halogen atom or an alkyl, alkoxy, alkenyl or fluoromethyl radical,

R″ denotes an alkyl, alkenyl or alkynyl radical containing up to 7 carbon atoms, the alkenyl radical optionally being substituted at the double bond by 1 or 2 chlorine or bromine atoms, and

n denotes 0, 1 or 2,

and salts thereof, which possess acaricidal properties.

3,787,576

COMBATING ANIMAL ACARID ECTOPARASITES WITH 2-PHENYLIMINOPYRROLIDINES

Edgar Enders, Cologne-Flittard, and Wilhelm Stendel, Wuppertal-Vohwinkel, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Original application June 18, 1969, Ser. No. 834,537, now abandoned. Divided and this application June 9, 1971, Ser. No. 151,516

Int. Cl. A01n *9/22*

U.S. Cl. 424—274 **6 Claims**

2-phenyliminopyrrolidines, i.e. 1-[alkyl and alkenyl]-2-[di and tri(halo and alkyl substituted)-phenylimino]-[optionally 3-, 4- or 5 - allyl substituted]-pyrrolidines, which possess parasiticidal properties, especially animal acarid ectoparasiticidal properties, and which may be produced by conventional methods.

3,787,577

METHOD OF TREATING DEPRESSION WITH CERTAIN DIAZEPINOINDOLES AND ANTI-DEPRESSANT COMPOSITIONS THEREOF

Joseph Francis Gardocki, Doylestown, Pa., assignor to McNeil Laboratories, Inc.

No Drawing. Filed Sept. 30, 1971, Ser. No. 185,361

Int. Cl. A61k *27/00*

U.S. Cl. 424—274 **12 Claims**

The anti-depressant activity of 2,3,4,5-tetrahydro-1H-1,4-diazepino[1,2-a]indoles, including those substituted in the 9-position with halo or lower alkoxy, and in the 11-position with lower alkyl.

3,787,578

METHOD OF TREATING HELMINTHIASIS

James W. McFarland, Lyme, Conn., assignor to Pfizer Inc.

Application Apr. 24, 1970, Ser. No. 12,552, now Patent No. 3,684,802, which is a division of application Ser. No. 675,285, Oct. 16, 1967, now Patent No. 3,629,423, and which in turn is a continuation-in-part of abandoned application Ser. No. 580,856, June 27, 1966. Divided and this application Mar. 10, 1972, Ser. No. 233,763

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 **3 Claims**

New 1-(2-arylvinyl) and 1-(2-arylacyl)pyridinium and α-picolinium salts and their use as anthelmintic agents.

3,787,579

MALONONITRILE OXIME DERIVATIVES AS FUNGICIDAL AGENTS

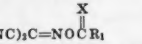
John E. Engelhart, Westfield, N.J., assignor to Esso Research and Engineering Company

No Drawing. Original application Apr. 15, 1970, Ser. No. 28,982, now Patent No. 3,694,482. Divided and this application June 15, 1972, Ser. No. 263,034

Int. Cl. A01n *9/12, 9/24*

U.S. Cl. 424—301 **1 Claim**

Deriatives of malononitrile oxime characterized by the following structural formula:



wherein X can be oxygen or sulfur; R_1 is taken from the group consisting of OR_2, SR_3, NR_4R_5 and C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_2–C_{10} alkynyl or C_3–C_{10} cycloalkyl; R_2, R_3, R_4 and R_5 can be hydrogen or C_1–C_{10} alkyl, C_2–C_{10} alkynyl or C_3–C_{10} cycloalkynyl or C_3–C_{10} cycloalkyl. The above-mentioned C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_2–C_{10} alkynyl and C_3–C_{10} cycloalkyl in R_1, R_2, R_3, R_4 and R_5 may be unsubstituted or substituted by halogen, nitrile, nitro, thiocyano, perhaloalkyl, C_1–C_4 alkoxy and C_1–C_4 thioalkyl.

3,787,580

2-(6′-METHOXY-2′-NAPHTHYL)PROPIONIC ACID AND -1-PROPANOL DERIVATIVES HAVING ANTI-INFLAMMATORY, ANALGESIC AND ANTI-PYRETIC ACTIVITIES

John H. Fried and Ian T. Harrison, Palo Alto, Calif., assignors to Syntex Corporation, Panama

No Drawing. Filed Jan. 11, 1971, Ser. No. 105,651

Int. Cl. A61k *27/00*

U.S. Cl. 424—308 **4 Claims**

2-(6′-methoxy-2′-naphthyl)-1-propyl 2″-acetoxybenzoate and 2″-carboxyphenyl 2-(6′-methoxy - 2′ - naphthyl) propionate have anti-inflammatory, analgesic and anti-pyretic activities.

3,787,581

PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATMENT

Merton Sandler, 10 Kilmorey Road, East Twickenham, Middlesex, England

No Drawing. Filed Mar. 22, 1971, Ser. No. 127,017

Claims priority, application Great Britain, Mar. 24, 1970, 14,365/70; July 28, 1970, 36,430/70

Int. Cl. A61k *27/00*

U.S. Cl. 424—319 **9 Claims**

m-Tyrosine and other compounds of the formula $m\text{-}HO.C_6H_4.CH_2.CHR_1.NHR$ where R is H or alkoxycarbonyl and R_1 is H, COOH or COOAlkyl are advanced for the treatment of depression, alone or concomitantly with dopa or other catecholic analogues of the foregoing compunds. Pharmaceutical compositions containing both types of compound are described, as is also the treatment of Parkinsonism using the two types of compound concomitantly.

3,787,582

PECTINASE ENZYME TREATING PROCESS FOR PREPARING HIGH BULK DENSITY TEA POWDERS

Gary Warner Sanderson, Englewood, N.J., and William Shaw Simpson, Charleston, S.C., assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

No Drawing. Filed June 23, 1971, Ser. No. 156,028

Int. Cl. A23f *3/00*

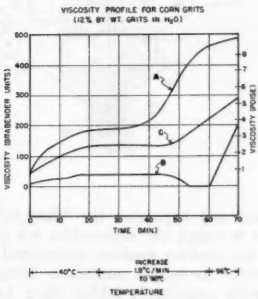
U.S. Cl. 426—50 **8 Claims**

Tea extracts, specifically, solubilized add-back tea extracts, are treated with a pectinase enzyme preparation, cooled and spray-dried to a high bulk density to form an instant tea product with improved clarity and color and which has a low tendency to form foam upon reconstitution with cold water.

3,787,583
LIVESTOCK FEED PROCESS
Frank J. Hruby, 2809 County Road 18, Ravenna, Ohio 44263
Continuation of abandoned application Ser. No. 500,798, May 17, 1966. This application Mar. 9, 1970, Ser. No. 70,763
Int. Cl. A23k *1/10, 1/06, 1/08*
U.S. Cl. 426—53 2 Claims

A method for making livestock feed from a raw garbage mass by screening, grinding, pressure-cooking with steam at 15–20 p.s.i. for about two hours, closed cooling and fermenting, continuously drying while separately flashing and extracting alcohol and water vapor, and comminuting.

3,787,584
INSTANT GRITS
Roy G. Hyldon, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.
Continuation-in-part of application Ser. No. 2,939, Jan. 14, 1970, now Patent No. 3,664,846. This application Nov. 9, 1971, Ser. No. 196,945
The portion of the term of the patent subsequent to May 23, 1989, has been disclaimed
Int. Cl. A23l *1/10*
U.S. Cl. 426—208 3 Claims



An emulsifier free instant-type corn grits food product produced by the process comprising the steps: (A) admixing corn grits, critical amounts of water, and critical amounts of polysaccharide gum; (B) heating the mixture in a first heating step which consists of a critical temperature range for a critical time period; (C) heating the above heated mixture in a second heating step which consists of a critical temperature range; (D) drying the mixture by forming the heated mixture in a thin sheet on a drum drier with the forming being conducted within a critical time period from the last heating step; and (E) comminuting the cooked, dried sheet.

3,787,585
STABLE LACTONE SOLUTION
Ryuzo Ueno, 10–27, Nango-cho, Nishinomiya-shi, Tetsuya Miyazaki, 4–12, Inano-cho, Itami-shi, and Shigeo Inamine, 7–14, Takatsuka-cho, Nishinomiya, Hyogo-ken, Japan, and Saburo Kishi, 1–4–5, Kiyosu, Kashiwara-shi, Osaka-fu, Japan
No Drawing. Filed Nov. 19, 1971, Ser. No. 200,622
Claims priority, application Japan, Nov. 25, 1970, 45/103,259; July 15, 1971, 46/52,091
Int. Cl. 23b *3/10, 1/12;* A21d *2/14*
U.S. Cl. 426—212 3 Claims

Preparation of a stable solution of a lactone of an aldonic acid or uronic acid, which comprises dissolving the lactone in an alcohol together with at least one salt selected from the group consisting of alkali metal salts, alkaline earth metal salts and ammonium salts of organic acids or inorganic acids, and acid addition salts of amino acids.

3,787,586
DENSIFIED HOP PRODUCTS AND PROCESS FOR PRODUCING SAME
Allan E. Hokanson, 6550 Willow Hollow Lane, Madeira, Ohio 45243; Raphael Katzen, 2868 Alpine Terrace, Cincinnati, Ohio 45208; and Bernard W. Schwartz, 63 Willow Road, New Shrewsbury, N.J. 07724
Filed Oct. 8, 1971, Ser. No. 187,681
Int. Cl. C12c *3/04*
U.S. Cl. 426—221 11 Claims

The present invention relates to a process for transforming hops into a densified form without losing the valuable bittering contents during the processing operation. The invention also provides a pelletized or densified product which has long shelf life and offers improved utilization of the bittering values in the hops. In addition the process can be modified to produce hops in the form of pellets having a highly enriched resin content.

3,787,587
ACCELERATED AGING OF ALCOHOLIC BEVERAGES
George Robert Weber, 16 Chemin Rojoux, 1211, Geneva-Conches, Switzerland
Continuation-in-part of abandoned application Ser. No. 835,536, June 23, 1969. This application Dec. 22, 1971, Ser. No. 210,925
Int. Cl. C12h *1/16*
U.S. Cl. 426—248 6 Claims

A process for the accelerated aging and maturation of alcoholic beverages normally subject to prolonged periods of aging, i.e., beers, distilled spirits, wines, etc., which comprises continuously passing actinic light into the beverage in substantially the wave-length range of about 4000 A. to 5500 A. at an irradiation dosage of about 1×10^{-1} to about 1×10^{-3} watts-sec./cm.^{3}. The resulting beverage has substantially the same chemical constituency and characteristics as the conventionally aged product.

3,787,588
METHOD OF MAKING SNACK FOOD
Evelyn Turitz, 2419 46th St., Meridian, Miss. 39301
No Drawing. Continuation-in-part of abandoned application Ser. No. 814,460, May 8, 1969. This application Feb. 9, 1972, Ser. No. 224,988
Int. Cl. A23l *1/36*
U.S. Cl. 426—302 4 Claims

A snack food is prepared by wrapping a nut with a thin shell of a dough consisting of a mixture of wheat flour and corn flour so that said dough contacts the skin of the nut and then baking the dough wrapped nut.

3,787,589
PROCESS FOR PREPARING CARROT JUICE
Thomas S. Stephens, Weslaco, Guadalupe Saldana, McAllen, and Harold E. Brown, Weslaco, Tex., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed Oct. 12, 1972, Ser. No. 297,123
Int. Cl. A23l *1/02, 3/34*
U.S. Cl. 426—325 3 Claims

An improved process for preparing carrot juice which process incorporates a process step of cooking in an acidic aqueous solution the whole carrots immediately prior to juice extraction.

3,787,590

METHOD FOR SOLUBILIZING TEA CREAM

Bert Borders, Keyport, N.J., Harold Rivkowich, Ossining, N.Y., and Warren C. Rehman, Montvale, N.J., assignors to Tetley, Inc., New York, N.Y.

No Drawing. Filed Jan. 27, 1971, Ser. No. 110,328

Int. Cl. A23f 3/00

U.S. Cl. 426—366 6 Claims

An increased yield of tea solubles is obtained by subjecting the insoluble precipitate or tea cream obtained by cooling a dilute tea extract to an oxidizing treatment in the absence of added alkali.

3,787,591

PROCESS FOR PRODUCING POWDERS OF GREEN LEAVES OF WHEAT AND BARLEY

Yoshihide Hagiwara, Takarazuka, Japan, assignor to Japan Natural Food Co., Ltd., Osaka, Japan

No Drawing. Filed Sept. 16, 1971, Ser. No. 181,196

Int. Cl. A23l 1/00

U.S. Cl. 426—373 4 Claims

Green juice is obtained by mechanically pulverizing the green leaves of barley or wheat in the pre-ripe stage. Course solid materials are removed from the juice and the pH is adjusted to 6.5 to 7.5. The treated juice is then spray dried or lyophylized to a powder. The powder can be incorporated into various foods and beverages and is a source of various proteins, vitamins, and minerals.

3,787,592

FIXED VOLATILE FLAVORS AND METHOD FOR MAKING SAME

William Alexander Mitchell, Lincoln Park, N.J., and Howard Dave Stahl, Tarrytown, and William Charles Seidel, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

No Drawing. Filed May 12, 1970, Ser. No. 36,666

Int. Cl. A23l 1/26

U.S. Cl. 426—380 11 Claims

Volatile flavoring compounds such as acetaldehyde are fixed in low amounts by having the compound present in solution during the crystallization of such edible materials as sucrose, mannitol, and sodium chloride. It is believed that the volatile flavors are entrapped as impurities within the crystal structure. The resulting compositions have excellent stability over a wide range of humidities, are soluble in both hot and cold water, and have application as flavor and aroma modifiers for foods.

3,787,593

METHOD OF PRODUCING ENHANCHED CITRUS JUICE ESSENCE

Cedric D. Atkins, Little Lake Elosie, and John A. Attaway, P.O. Box 205, both of Winter Haven, Fla. 33880

Original application Jan. 26, 1971, Ser. No. 109,922. Divided and this application Sept. 6, 1972, Ser. No. 286,791

Int. Cl. A23l 1/26

U.S. Cl. 426—429 12 Claims

An aqueous citrus essence is prepared having an enhanced content of components which contribute to the natural flavor of the citrus juice, particularly certain aldehyde type compounds and a decreased content of components, such as easily oxidized fatty substances, which detract from the flavor of the juice. Preparation of the enhanced citrus essence is accomplished by increasing the alcoholic content of the aqueous phase of the essence so that its capacity for desirable aldehyde type components is increased. The increase in alcoholic content is effected by recirculation under appropriate conditions of temperature and pressure of the aqueous phase of the essence in contact with fresh essence. An apparatus is specifically disclosed for effecting the process of the invention. Enhanced essence produced by the present invention is particularly useful for reconstituting the flavor of citrus juice concentrates such as orange juice.

3,787,594

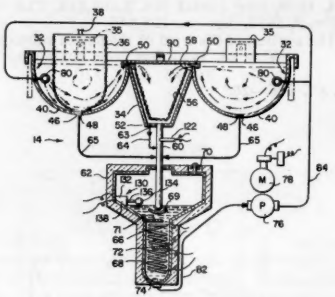
METHOD OF COOKING COMESTIBLES

Einar H. Palmason, Fort Lauderdale, Fla., assignor to Parkson Industrial Equipment Company, Fort Lauderdale, Fla.

Filed July 30, 1968, Ser. No. 748,743

Int. Cl. A23l 1/00; A47j 37/12

U.S. Cl. 426—438 2 Claims



A method and apparatus for "deep-fat" cooking of comestibles in which the comestibles are immersed in a bath of a hot cooking medium maintained in a cooking vessel in which the heated medium is being continuously changed while cooking is taking place by flowing the heated medium into the bath and through and around the comestibles, overflowing it from the surface of the bath into a heating reservoir and reheating and recirculating it in a manner so as to sweep from the bath loose particles of comestibles so as to maintain the bath at the required cooking temperature. The overflow of the heated medium is filtered to remove the loose particles of comestibles before the medium is reheated and returned to the bath, and a small quantity of the oil is continuously drained from the cooking vessel during cooking operation and completely drained from the vessel when the cooking operation is stopped so as to return the cooking medium to the heating reservoir.

3,787,595

PROCESSING OF BEANS AND PEAS BY FREEZE DRYING

Robert G. Folzenlogen, Green Township, Hamilton County, and James P. Smith, North College Hill, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Nov. 17, 1971, Ser. No. 199,739

Int. Cl. A23l 1/20

U.S. Cl. 426—441 12 Claims

A process for producing nut meat substitutes from edible leguminous seeds comprising the steps of soaking in an aqueous medium, freeze drying, and roasting said

seeds; additionally, when it is desired to obtain a nut meat substitute having a particular form such as the physical dimensions of various expensive nut meats, the steps of comminuting and forming are interposed between the soaking step and the freeze drying step.

3,787,596

TREATMENT OF WASTEWATERS FROM THE PROCESSING OF FISH

Edgar H. Pavia and Amulya D. Tyagi, New Orleans, La., assignors to Pavia-Byrne Engineering Corporation, New Orleans, La.

Filed Mar. 8, 1972, Ser. No. 232,717
Int. Cl. A22c *25/00*
U.S. Cl. 426—488 **10 Claims**

A method for treating emulsified wastewater from fish processing plants by (1) degassifying the wastewater to break the emulsion and to remove any toxic gases and (2) separating the fish solids and oil from the deemulsified wastewater. This method allows the safe reuse of transport water used in the unloading of fish from boats.

3,787,597

CONTINUOUS PROCESS FOR PREPARING RELATIVELY DENSE BAKERY GOODS

William R. Dryg, Tofte, and Charles N. Standing, Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Nov. 26, 1971, Ser. No. 202,488
Int. Cl. A21d *13/08, 13/00*
U.S. Cl. 426—496 **8 Claims**

Dense bakery goods such as brownies, cocoanut bars, cookies, are prepared by mixing together dough ingredients and passing the mixed dough continuously through a cooker in which mixing is carried out during heating until the product reaches a temperature on the order of at least 200° F. to give the product a cooked or baked character. If the product is to be porous, pressurized gas is introduced either before or after heating. In the second stage of the process, the cooked material is unified by placing relatively large pieces on a flat supporting surface where the product is held in a quiescent condition as its consistency becomes firm. Its exposed surface can be treated by the application of heat to provide a dried surface crust similar to that which forms when bakery goods are oven-baked conventionally.

ELECTRICAL

3,787,598
FURNACE AND METHOD FOR THE PYRO-CHEMICAL PROCESSING OF NUCLEAR REACTOR FUEL ELEMENTS

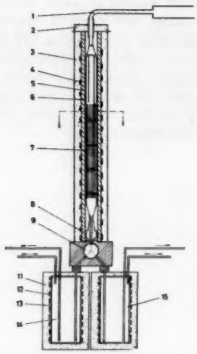
Joseph Wurm, Mol-Donk, Belgium, assignor to European Atomic Energy Community (Euratom), Luxemburg, European Center, Kirchberg, Luxembourg

Filed Jan. 25, 1971, Ser. No. 109,111

Claims priority, application Netherlands, Feb. 9, 1970, 7001798

Int. Cl. F27d *7/06, 11/02*

U.S. Cl. 13—22 **4 Claims**



A furnace for the pyrochemical processing of nuclear reactor fuel elements comprises a vertical tube which is adapted to receive the fuel element. The bottom of the tube has a graphite filter element connected to at least one closable aperture through which, in turn, molten metal and molten salts may be introduced firstly to effect dissolution of the stainless steel sheaths of the fuel rods and secondly to pulverize and remove the fuel in the molten salts through the filter.

3,787,599
EDUCATIONAL TOY FOR THE TEACHING OF NUMERICAL RECOGNITION

George Castanis, New York, N.Y., assignor to Questor Corporation, Toledo, Ohio

Filed Feb. 7, 1973, Ser. No. 330,438

Int. Cl. G09b *19/02*

U.S. Cl. 35—31 R **5 Claims**

A plurality of egg-shaped articles which may be placed in a series of wells in a container. Each of the egg-shaped articles are comprised of half-sections which may be frictionally mated in a male-female manner. The inner face of one half-section includes a fixed number of holes and the inner face of the other half-section includes a like number of pegs. Each of said articles contain a different number of peg-hole combinations. A numeral indicia may be placed on the inner faces of the half-sections.

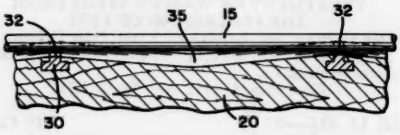
3,787,600
GUITAR FRET BOARD

Gary O. Muncy, 1015 Skyview Dr., West Carrollton, Ohio

Filed Apr. 23, 1973, Ser. No. 353,403

Int. Cl. G10d *3/06*

U.S. Cl. 84—314 **14 Claims**



A guitar provided with an improved fret board construction for easy fingering and faster action, in which grooves are formed in underlying relation to the strings, the diameter of the grooves being related to that of the strings so that when a string is depressed in the groove approximately 80 percent of the string is received in the groove. The grooves undulate from high regions at the fret to depressed regions between the frets to provide portions which slope away from the frets defining fingering regions. The metal frets are formed with essentially the same configuration as that of the fret board in that the exposed surfaces are flush with the fret board at the bottom of the groove, so that when the string is fingered there is a minimum of protrusion of the string and thus a minimum of discomfort. The increased action is due to the absence of obstacles by reason of absence of protruding frets.

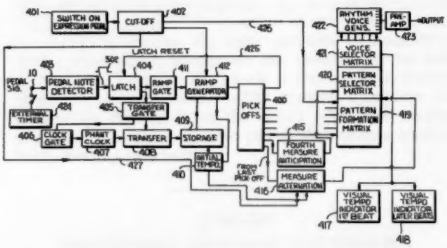
3,787,601
RHYTHMIC INTERPOLATORS

Donald J. Campbell, Cincinnati, Ohio, assignor to D. H. Baldin Company, Cincinnati, Ohio

Division of Ser. No. 619,381, Feb. 28, 1967, Pat. No. 3,522,358, Continuation of Ser. No. 45,675, June 12, 1970, abandoned. This application Feb. 7, 1972, Ser. No. 224,364. The portion of the term of this patent subsequent to July 28, 1987, has been disclaimed.

Int. Cl. G10f *1/00*

U.S. Cl. 84—1.03 **10 Claims**



A system for development of rhythmic patterns in which repetitive ramp wave forms are developed, the repetition rate of which is controlled, pulses being developed by sampling the ramp wave forms at predetermined levels, certain of the pulses being selected by means of a matrix to form each required pattern. The minima and maxima of the ramps are maintained at fixed levels and the slopes of the ramps are conformed to the desired repetition rates in accordance with the tempo of a

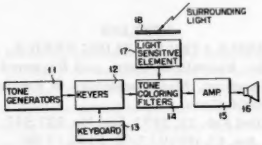
player controlled instrument, such as an electric organ. Provision is made for extending rhythm patterns over two measures, each different from the other, for inserting additional beats near the end of each fourth measure of a piece of music, provision of visual tempo indication, and provision of a cutoff for instant abortion of the presently played measure, allowing rapid changes of tempo.

3,787,602

ELECTRONIC MUSICAL INSTRUMENT WITH SURROUNDING LIGHT SENSITIVE MUSICAL EFFECT CONTROL

Mitsuo Okudaira, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Oct. 11, 1972, Ser. No. 296,597
Claims priority, application Japan, Oct. 21, 1971, 46/82876
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.24 **11 Claims**



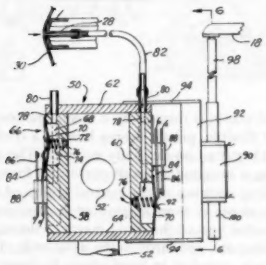
An electronic musical instrument comprising a light-sensitive variable resistor whose resistance varies with the intensity of surrounding light and a musical effect control circuit for controlling musical effects such as the volume and color of tones in accordance with the varying resistance of the variable resistor. The musical effect control circuit comprises a variable gain amplifier, tone coloring filter, vibrato oscillator or tremolo oscillator, and the light-sensitive variable resistor is used in the musical effect control circuit to vary, for example, the volume and color of tones, and the speed of vibrato and tremolo according to the condition of surrounding light.

3,787,603

AUTOMATIC PLAYER FOR MUSICAL INSTRUMENTS

Morris Ghere, 1234 S. Lincoln, Centralia, Ill.

Filed June 22, 1973, Ser. No. 372,777
Int. Cl. G10f *1/02*
U.S. Cl. 84—19 **11 Claims**



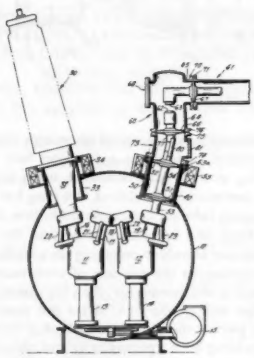
An automatic musical instrument, such as a player piano, having a tracker with openings over which a music roll, having apertures corresponding to music notes, is fed by operation of pneumatic or electric motor means, and hammers and hammer jacks operable to sound the musical notes, is provided with an elongated box having a pair of opposed thickened walls and forming a vacuum chamber, evacuating means for the chamber, a plurality of cavities formed in the thickened walls, one for each note to be played, said cavities being closed by diaphragms, a small vent passage communicating each cavity with the interior of the vacuum chamber, a separate air passage, preferably within the thickened walls, communicating each cavity with a respective opening in the tracker, a weak spring in each of said cavities biasing its diaphragm outwardly but allowing movement of the diaphragm inwardly of the cavity when the vacuum chamber is evacuated, and a pair of electric contact members for each cavity mounted on one of said thickened walls and having one contact member engaging the diaphragm so as to make or break contact between the pairs of members when the diaphragm moves from a position inwardly of the cavity to a distended position outwardly of the cavity, a solenoid associated with each cavity and diaphragm and having a plunger arranged to lift a respective one of the hammer jacks, and electric circuit means connecting the pairs of contact members, the solenoids and a source of electric power in such manner that each of the pairs of contacts serves to energize and de-energize one of the solenoids.

3,787,604

CONDUCTOR SUPPORT FOR TRANSITION FROM GAS BUS ENCLOSURE TUBE TO POWER CIRCUIT BREAKER

Giovanni Paolo Guaglione, Irvine, Calif., assignor to I-T-E Imperial Coroporation, Philadelphia, Pa.

Filed Oct. 27, 1972, Ser. No. 301,643
Int. Cl. H01h *33/02*; **H01b** *17/26*
U.S. Cl. 174—18 **8 Claims**



An insulation disk or cone supports the conductor extending from a power circuit breaker to a gas-filled bus, and also serves as a gas barrier.

3,787,605

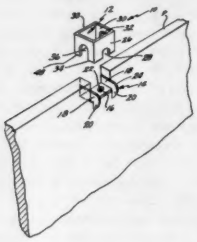
WIRING ACCESS MEANS

Robert C. Van Gessel, Grand Rapids, and Dirk J. Van Kuik, Jenison, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

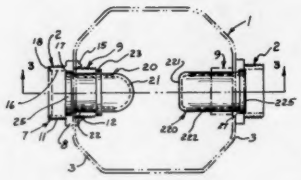
Filed July 14, 1972, Ser. No. 271,811
Int. Cl. A47b *13/00*
U.S. Cl. 174—48 **24 Claims**

A wiring access enclosure for insertion into a wiring access opening in a desk or the like. The enclosure is adapted to accept and secure various wire sizes and includes a generally cube-shaped plug member having wire-receiving apertures of different sizes on each of its several sides. A mounting member fixed in an access opening or recess formed in the fur-

niture is adapted to releasably secure the plug member in any one of several positions so that a selected aperture is positioned for passage of a wire. One side of the plug is solid to close the access opening when desired.

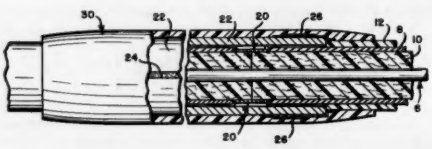


3,787,606
CONNECTOR ASSEMBLY AND METHOD OF USE
Charles H. Schaeffer, 3144 Ringer Rd., Mehlville, Mo.
Filed Apr. 12, 1973, Ser. No. 350,331
Int. Cl. H02g *3/02*
U.S. Cl. 174—65 R **10 Claims**



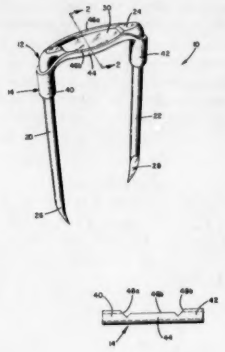
In a combination of electrical connector fitting of the type used to connect conduit to a junction box, the connector fitting having an externally threaded, open mouth throat end and a plug mounted in the throat, the plug has an open-ended throat-engaging tube section, a closed hollow dome projecting outwardly from and substantially beyond the mouth, and an external annular shoulder engaging an annular radial surface of the connector. In the process of construction, the plug is first mounted in the connector, then the connector is mounted in a junction box or the like. After the junction box is emplaced, the part of the plug dome which projects in the box is cut off, providing both a passageway and an insulative throat.

3,787,607
COAXIAL CABLE SPLICE
Hubert J. Schlafly, Fort Lee, N.J., assignor to Teleprompter Corporation, New York, N.Y.
Filed May 31, 1972, Ser. No. 258,435
Int. Cl. H02g *15/08*
U.S. Cl. 174—88 C **14 Claims**



Coaxial cables are spliced together by laying bare a length of center conductor on one end of each cable, joining the center conductors coaxially, enclosing the joined lengths of center conductor in dielectric material of substantially the same outer diameter as the inside diameters of the outer conductors of the cables being spliced, and providing at least one layer of conductive material over the dielectric material to extend lengthwise of the cable from one outer conductor to the other and circumferentially of the cable substantially over the entire circumference thereof. The conductive material may include sections of flexible foil intimately conformable to the shape of the outer conductors of the cable in order to insure transmission of radio frequency energy across the splice, either capacitively or conductively, and it may include splints in the form of substantially semi-cylindrical shells extending from the outer conductor of one cable to that of the other and conductively connected thereto in order to insure transmission of low frequency or direct current energy across the splice.

3,787,608
INSULATED STAPLING DEVICE
Harold S. Colby, Bloomfield, Conn., and Raymond H. Landry, South Ashburnham, Mass., assignors to Emhart Corporation, Bloomfield, Conn.
Filed Feb. 22, 1972, Ser. No. 227,842
Int. Cl. H01b *17/00;* **F16b** *15/00*
U.S. Cl. 174—159 **11 Claims**

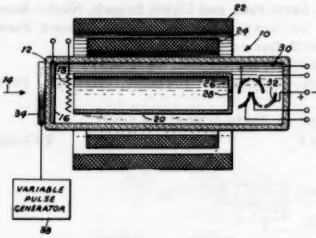


An insulated staple is formed by a U-shaped body member and a piece of flexible, plastic tubing bent in a U-shaped configuration and installed on the body member. The plastic tubing is cut along a longitudinal wall portion to form a longitudinally extending opening at the central region of the tubing. The insulated staple is then assembled by inserting the opposed and parallel legs of the body member through the longitudinal opening and out through the axial ends of the tubing so that the body member is lined along its inner periphery between the end portions of the tubing mounted on the opposed and parallel legs. The method for making the insulated staple comprises cutting the longitudinal opening in the tube, bending the tube in a U-shaped configuration and inserting the legs of the body member through the axial ends of the tubing so that the pointed tips are exposed and the inner periphery of the staple is lined between the end portions of the tubing on the parallel legs.

3,787,609
ELECTRONIC COLOR FILTER SYSTEM

Charles A. Plumeau, Plano, Tex., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 13, 1972, Ser. No. 262,401
Int. Cl. H04n 9/06
U.S. Cl. 178—5.4 ST 7 Claims

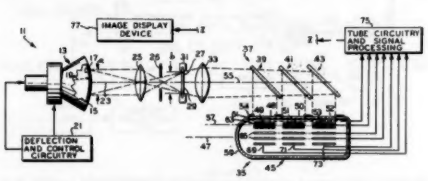


An image scanning system employs a solid state color filter providing a plurality of selectable discrete colors which are produced by voltage pulses of different amplitudes applied to the filter in a predetermined sequence. The filter is disposed on the faceplate of an image dissector tube which scans a scene and provides an output signal carrying the color information. A single camera tube with one electron multiplier can generate the three primary colors using a frame sequential, line-sequential, element-by-element or a random scanning system. The output signal may be transmitted to a receiver display tube having a like color filter with synchronized switching voltages or a standard three gun color cathode ray tube.

3,787,610
SIGNAL TRANSDUCER INCORPORATING A MULTI-CHANNEL PHOTOMULTIPLIER TUBE

William D. Murphy; George Norman Williams; Robert F. Wilson, and Edward I. Zmuda, all of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed July 10, 1972, Ser. No. 270,217
Int. Cl. H04n 9/04
U.S. Cl. 178—5.4 E 10 Claims

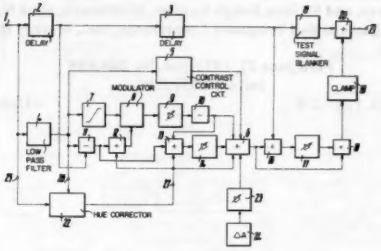


A multi-channel photomultiplier tube is utilized in a compact optical-to-electrical signal transducer system employed for displaying a film image on the screen of a CRT display device. Optional information derived from scanning the film area with a beam of radiant energy is translated to electrical signals and suitable processed to effect the display imagery. The radiant energy modified by passage through the film image is directed through a condensing lens and a mirror system to convey discrete components of the scanning energy to separate cathode areas of the multi-channel tube, the longitudinal axis of which is substantially in a common plane with the optical axis of the transducer. Utilization of the multi-channel tube promotes compact packaging and provides improved quality of the output of the system.

3,787,611
SYSTEM FOR CORRECTING COLOR TELEVISION SIGNALS

Dieter Poetsch, and Heinz Hess, both of Darmstadt, Germany, assignors to Robert Bosch Fernsehanlagen GmbH, Darmstadt, Germany

Filed Aug. 31, 1972, Ser. No. 285,230
Claims priority, application Germany, Sept. 7, 1971, P 21 44 745.0
Int. Cl. H04n 9/12
U.S. Cl. 178—5.4 AC 4 Claims

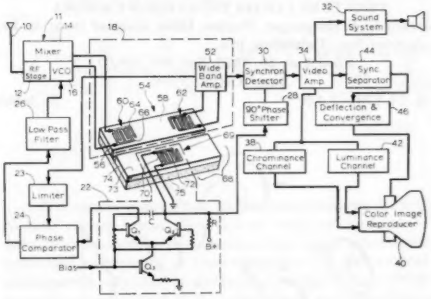


A system for correcting complete color television signals, including luminance, color saturation and hue signals. A first channel delays the signal while a second channel derives the necessary corrections for the delayed first channel signal.

3,787,612
SIGNAL PROCESSING SYSTEM FOR TELEVISION RECEIVER HAVING ACOUSTIC SURFACE WAVE DEVICES FOR IMPROVED TUNING AND VIDEO DEMODULATION

Adrian J. DeVries, Elmhurst, and Jouke N. Rypkema, Lombard, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed July 3, 1972, Ser. No. 268,280
Int. Cl. H04n 5/50
U.S. Cl. 178—5.8 AF 11 Claims



This disclosure depicts a number of signal processing circuits for a television receiver which include acoustic surface wave devices for improved tuning and video demodulation. In each embodiment an IF stage has an acoustic surface wave bandpass filter. In one embodiment a reference oscillator forming part of a synchronous video detector and also part of an APC loop has a frequency-selective surface wave filter for establishing its frequency of oscillation. Another embodiment has an AFC circuit including a surface wave discriminator. In all embodiments the acoustic surface wave devices have

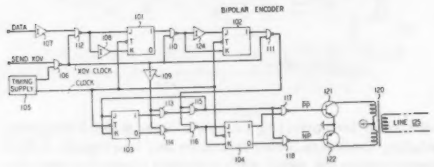
similar thermal characteristics and thermal exposure so as to cause temperature tracking of the frequency characteristics thereof and thereby to temperature stabilize the receiver. The surface wave filter devices which are associated in the disclosed systems may utilize thermally homogeneous piezoelectric substrate means.

3,787,613

PULSE TRANSMISSION SYSTEM FOR CONVEYING DATA AND CONTROL WORDS BY MEANS OF ALTERNATING POLARITY PULSES AND VIOLATIONS THEREOF

Wayne David Farmer, Matawan; Joseph George Kneuer, Fair Haven, and William Joseph Lawless, Middletown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 27, 1972, Ser. No. 266,685
Int. Cl. H03r *5/20*
U.S. Cl. 178—2 R **4 Claims**



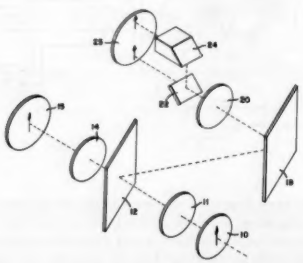
The data bits of data words are encoded into bipolar pulses, the polarity of each pulse differing from the polarity of the prior pulse. When the data bits of a control word are encoded, there is also generated a bipolar pulse violation, the pulse having the same polarity as the prior pulse. Additional bipolar pulses may be inserted to insure that an odd number of bipolar pulses separate pulse violations, successive violations thereby having opposite polarities. A remote decoder converts the bipolar pulses to data bits and the data bits of each control word are recovered from the decoder when the bipolar pulse violation is received.

3,787,614

TWO-TUBE COLOR TELEVISION CAMERA

Edward C. Waldspurger, Dayton, Ohio, assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Apr. 20, 1972, Ser. No. 246,071
Int. Cl. H04n *9/04*
U.S. Cl. 178—5.4 R **5 Claims**



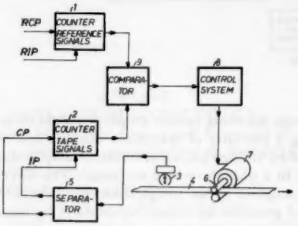
A color television camera uses two pick-up tubes with the full scene imaged on one tube and red and blue color components of the scene imaged in vertically aligned relation on the other tube. Standard scanning is employed for the one tube, and the same horizontal scan is used for the other tube, with its vertical scanning being changed on a line sequential basis between the red and blue images by causing a vertical scan deflection from one to the other of the two image areas.

3,787,615

METHOD AND APPARATUS FOR SYNCHRONIZING A VIDEOSIGNAL REPRODUCED FROM A TAPE BY MEANS OF A ROTATING HEAD WHEEL

Hubert Foerster, Darmstadt, and Ulrich Brauch, Nieder-Beerbach, both of Germany, assignors to Robert Bosch Fernsehanlagen GmbH, Darmstadt, Germany

Filed May 19, 1972, Ser. No. 254,911
Claims priority, application Germany, May 19, 1971, P 21 24 923.0
Int. Cl. H04n *5/76*; **G11b** *5/00*
U.S. Cl. 178—6.6 P **8 Claims**



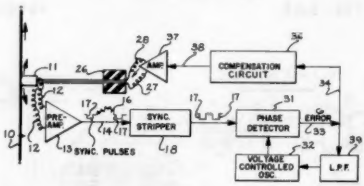
Method and apparatus for synchronizing a video signal with reference signals to shorten the run-in period of video tape recorders.

3,787,616

TIME BASE ERROR CORRECTION SYSTEM AND METHOD

Mervin L. Falk, Sunnyvale, and Louis Olah, San Jose, both of Calif., assignors to Newell Industries Inc., Sunnyvale, Calif.

Filed June 5, 1972, Ser. No. 259,980
Int. Cl. H04n *5/76*
U.S. Cl. 178—6.6 A **7 Claims**



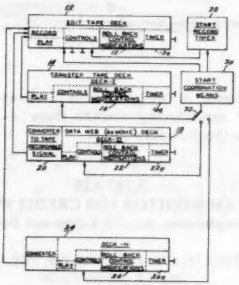
A time base error correction system particularly useful in a magnetic recording or playback system for transducing signals relative to a magnetic record medium prepared with discrete signals thereon, or being applied thereto, at substantially regular, predetermined intervals along with information signals all to be transduced as the medium moves in a predetermined direction. A magnetic transducer cooperates with the medium to sense these signals to provide a first train of electric signals. Means are provided for generating a second train of signals at a desired repetition rate. A comparing means is coupled to receive both the first and second trains of signals and arranged to provide an output control signal representative of the phase difference between the two trains. Finally, means supporting the transducer means and responsive to the control signal adjusts the phase of the first train of signals by advancing or retarding the position of the transducer means along the direction of movement of the medium.

3,787,617

MAGNETIC TAPE EDITING METHOD AND SYSTEM

Anthony M. Fiori, Schwenksville, Pa., assignor to Spectra-Vision Corporation, Philadelphia, Pa.

Filed May 15, 1972, Ser. No. 253,577
Int. Cl. G11b 5/00
U.S. Cl. 179—100.2 B 16 Claims



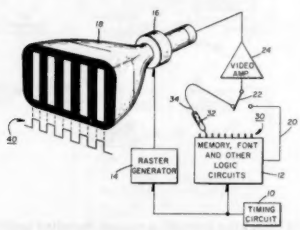
In making a composite edited tape from at least one master tape, back-spacing of both the master and edit tapes is accomplished by positive fixed speed drives on each tape deck, each in combination with a timer precisely measuring back-spacing distance so that the tape back-spacing will be the same from one time to another, the time in each case being that time which is necessary for its associated tape deck to reach proper speed for recording at the point of edit. The back-spacing times of decks requiring less back-spacing are increased to correspond to that of the slowest to respond. A timing mechanism is started at the same time both tape decks are started causing the edit tape deck to start to record when the decks are up to speed and ready for recording at the point of edit.

3,787,618

CATHODE RAY TUBE DISPLAY DEVICE INCLUDING TEST PROBE ADAPTER

Harold D. Cook, Wheaton, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Oct. 24, 1972, Ser. No. 299,974
Int. Cl. G01r 29/02
U.S. Cl. 178—6.8 2 Claims



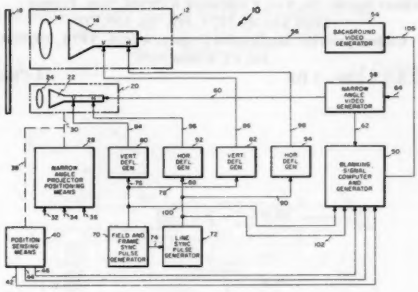
A system for using the video amplifier and the X and Y axis raster scanning circuits of a CRT display device in conjunction with a measuring probe to form a Z-axis oscilloscope observing the output of intermediate signals in the CRT display logic circuit in order to obviate a separate service-man-supplied oscilloscope.

3,787,619

WIDE ANGLE DISPLAY SYSTEM

Hanns H. Wolff, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 7, 1972, Ser. No. 260,616
Int. Cl. H04n 7/00
U.S. Cl. 178—6.8 9 Claims


BACKGROUND VIDEO GENERATOR
NARROW ANGLE VIDEO GENERATOR
NARROW ANGLE PROJECTOR POSITIONING MEANS
VERT DEFL GEN
HOR DEFL GEN
BLANKING SIGNAL COMPUTER AND GENERATOR
POSITION SENSING MEANS
FIELD AND FRAME SYNC PULSE GENERATOR
LINE SYNC PULSE GENERATOR

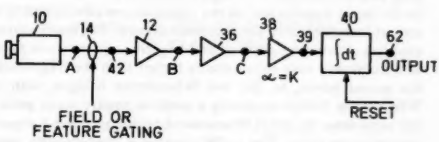
A wide angle display system wherein a wide angle background scene has a hole cut therein to receive a narrow angle computer generated insert picture. The necessary blanking signals are computed and generated for each wide angle field based on the narrow angle picture data for the immediately preceding field.

3,787,620

DENSITY MEASUREMENT BY IMAGE ANALYSIS

Leon Andre Pieters, Cambridge, and David Charles Ward, Melbourn, near Royston, both of England, assignors to Image Analysing Computers Limited, Melbourn, Royston, England

Filed Mar. 24, 1972, Ser. No. 237,724
Claims priority, application Great Britain, Apr. 17, 1971, 9,739/71; Apr. 17, 1971, 9,740/71; Apr. 17, 1971, 9,737/71
Int. Cl. H04n 3/16
U.S. Cl. 178—7.1 21 Claims



A first system is described for analysing features according to their optical density in which an image of the features is formed on a television camera tube target and a video signal is generated by scanning in known manner. The video signal is subsequently amplified to produce an output voltage which is logarithmically related to the video signal and integration of the output signal pulses provides a measure of the total integrated density of the detected feature content in the field. The invention thus utilises the light integrating properties of a television camera tube.

Two methods of removing amplitude excursions relating to unwanted regions and features of the field are also described.

A signal corresponding to the mean density of detected feature content is obtained by dividing the total integrated density signal by one relating to the area of the detected features.

A method is disclosed for relating the density information arising during a field scan to the features in the field from which the information arises and releasing the accumulated density information for each feature at a unique point in the

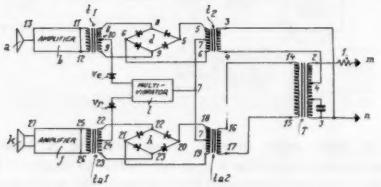
line scan. This is achieved by employing an associated parameter computer such as is described and claimed in British Patent Specificiations Nos. 1,264,804 and 1,264,805.

3,787,621

TELEPHONE SET WITH TRANSMISSION BY MICROPHONE AND AMPLIFIER AND RECEPTION BY LOUDSPEAKER

Albert Barok, 36, Ave. d'estrienne d'Orves, Nice, France

Filed Aug. 6, 1971, Ser. No. 169,770
Claims priority, application France, Aug. 6, 1970, 7029610
Int. Cl. H04m 9/08
U.S. Cl. 179—1 HF **4 Claims**



A telephone set has sound transmission by a microphone and amplifier over a transmission circuit, and sound reception by loudspeaker over a reception circuit. Each circuit includes an input transformer and an output transformer, and both circuits are connected, through a telephone transformer, to the line. The telephone set includes an arrangement for preventing the Larsen effect and other interference between the two circuits. This arrangement includes respective sets of four diodes or transistors, connected as a Wheatstone bridge, each connected between an input transformer and the associated output transformer. A square wave multi-vibrator is connected in parallel to the output transformer of the transmission circuit and to the input transformer of the reception circuit, and is connected, through respective diodes or transistors to the input transformer of the transmission circuit and to the output transformer of the reception circuit. The multi-vibrator supplies alternating positive and negative square wave pulses, at a frequency very substantially higher than the frequency of the sound waves, to the two Wheatstone bridges, with one Wheatstone bridge receiving a positive square wave pulse at the same time the other Wheatstone bridge receives a negative square wave pulse. The multi-vibrator is continuously operative, and, in effect, chops the modulated currents in the two circuits at a very high frequency of the order of 0.5 MHz.

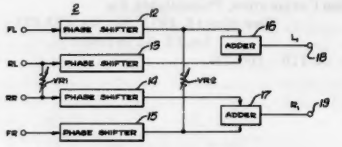
3,787,622

QUADRASONIC SOUND SYSTEM FOR TWO CHANNEL TRANSMISSION

Ryosuke Itoh, and Toshiaki Ishida, both of Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1972, Ser. No. 222,516
Claims priority, application Japan, Feb. 5, 1971, 46-4440; Sept. 1, 1971, 46-79136; Sept. 1, 1971, 46-79137
Int. Cl. H04r 5/00
U.S. Cl. 179—1 GQ **30 Claims**

A signal transmission system comprising microphones for obtaining 4-channel signals by collecting sounds produced in a sound source room, an encoder for producing 2-channel signals by combining the 4- channel signals with such a phase relationship as prevents them from offsetting each other, means for transmitting said 2-channel signals, a decoder for producing 4-channel signals by combining said 2-channel signals with such a phase relationship as prevents them from offsetting each other so as to form signals representing the



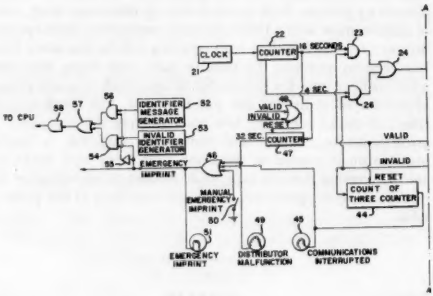
sum and balance or difference of 2-channel signals, and speakers for reproducing sounds from 4-channel signals reproduced in the decoder.

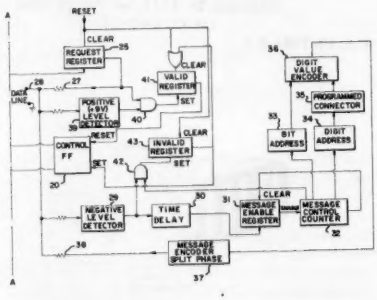
3,787,623

SYSTEM MONITOR FOR CREDIT SYSTEM

Kenrick O. Stephenson, Jr., 79 Edgemont Rd., Upper Montclair, N.J.

Filed Mar. 9, 1971, Ser. No. 122,467
Int. Cl. H04m 11/06
U.S. Cl. 179—2 DP **3 Claims**





In a credit checking system, a system monitor tests the communications link between counter units in outlying stores and a central location. The system monitor periodically sends Request signals over a telephone line to the central processing unit. In response to an unconditionally valid account number encoded by the system monitor and transmitted to the control processing unit (CPU), a valid signal is returned to the monitor. If this valid signal is not received, the counter units are switched to an emergency imprint mode which allows all

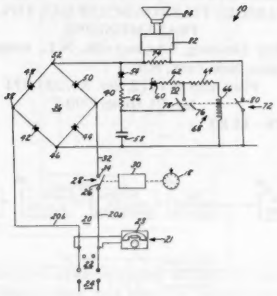
counter units to operate as if the CPU were transmitting valid signals to the units. Indicating devices are provided at the central processor and at the stores for indicating the nature of the malfunction in communications and to facilitate troubleshooting.

3,787,624

REMOTE CONDITION MONITORING DEVICE

Arnold Spitalny, Dix Hills; George Brettbart, New York, and Stanley R. Sporn, Oceanside, all of N.Y., assignors to Atron Industries, Inc., Dix Hills, N.Y.

Filed May 22, 1972, Ser. No. 255,662
Int. Cl. H04m *1/04*
U.S. Cl. 179—2 A **14 Claims**



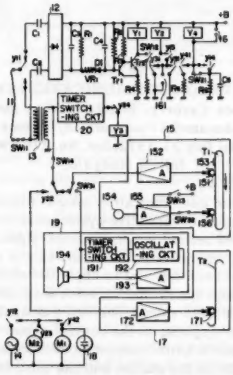
A remote condition monitoring device is operative to connect into preexisting telephone station lines when a monitored physical condition exceeds preset limits. An incoming call causes completion of the calling circuit by simulating the lifting of a receiver at the called station. A warning tone is produced which is audible to the caller over the completed telephone calling circuit.

3,787,625

AUTOMATIC TELEPHONE ANSWERING APPARATUS WITH CONFIRMATION OF ANSWER GAP LENGTH FOR MIDCYCLE SWITCHING

Takashi Sato, Kawasaki, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed July 14, 1971, Ser. No. 162,599
Claims priority, application Japan, July 18, 1970, 45/63023 [U]
Int. Cl. H04m *1/64*; G11b *27/22*
U.S. Cl. 179—6 R **3 Claims**



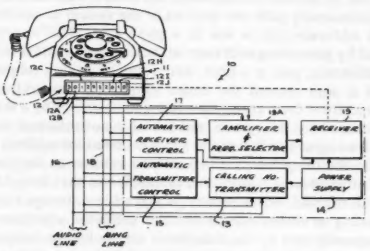
Disclosed herein is an automatic telephone answering apparatus which sends out an outgoing message to a calling party in a minimum time period and automatically switches to a recording state to record an incoming message from the calling party in response to the end of the outgoing message even though the tape which carries the outgoing message has not completed an entire revolution.

3,787,626

SYSTEM FOR AUTOMATIC IDENTIFICATION OF CALLING PARTY'S TELEPHONE NUMBER TO RECEIVING PARTY

Carlos Subieta, 11000 Newpor Mill Rd., Kensington, Md.

Filed Apr. 23, 1971, Ser. No. 136,810
Int. Cl. H04m *15/06*
U.S. Cl. 179—5.5 **11 Claims**



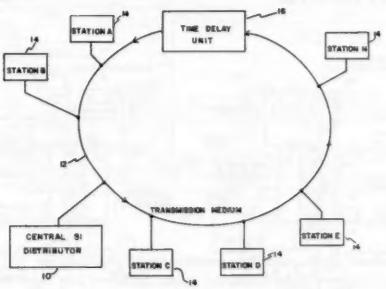
An automatic system for displaying the calling party's telephone number at the telephone set of the called party when the circuit therebetween is initiated, including apparatus associated with each telephone subscriber's lines activated automatically responsive to signals indicating connection with the called telephone to generate pulse trains signifying the telephone number of the calling party. Readout display devices and pulse receiver equipment at the called telephone respond to the pulse trains to display the telephone number signified thereby.

3,787,627

CENTRAL ADDRESS DISTRIBUTOR

Carl Newton Abramson, Somerville, and Mark T. Nadir, Warren, both of N.J., assignors to Adaptive Technology, Inc., Piscataway, N.J.

Filed Dec. 15, 1971, Ser. No. 208,261
Int. Cl. H04j *5/00*
U.S. Cl. 179—15 BA **29 Claims**



An address-coded communication system is disclosed wherein the size of the address set required in the system is reduced essentially to the maximum number of stations communicating at any time, as contrasted with requiring an address set size equal to the number of stations located in the

system. Specifically, a central address distributor is provided which distributes available identifying address codes on the transmission medium in a manner which makes such address codes available to communicating stations for the duration of a link. In one embodiment, a station desiring to go on line makes a bid for an identification address from the central address distributor and by means of a special handshaking technique, the central address distributor assigns an identification address to that user. When such station terminates the call, it returns its assigned address to the central address distributor so that such address can subsequently be re-assigned to another station or user. Special subperiods are assigned within a period for both sending addresses being distributed from the central address distributor, and for returning the addresses from the stations to the central address distributor after use. In another embodiment, the central address distributor continuously polls the stations of the system to determine which addresses are in use at a given time. This is accomplished by generating addresses at the distributor and inserting the addresses, one at a time, into a special polling subperiod which is sent around the entire system. If this address is removed from the transmission line and absorbed by a station or mutilated by the system and therefor not returned to the central address distributor, then it is assumed the address is in use. On the other hand, if this address returns on the line to the central address distributor, this indicates that the address is not in use and, consequently, is placed in a storage register containing available addresses. The available addresses are subsequently sent by the distributor on the line in designated address distributor subperiods from which any station can remove and use an address on a first come basis. In this embodiment, after a station terminates a call and is through using an address, it need not return the address directly to the central address distributor since such distributor is continuously polling the stations to determine which addresses are in use. The central address distributor permits reduction of the size of the address set required, resulting in economizing on system bandwidth and increased system efficiency.

3,787,628

COMMUNICATION SYSTEM FOR THE TRANSMISSION OF INFORMATION BETWEEN TWO TERMINAL STATIONS BY PULSE CODE MODULATION

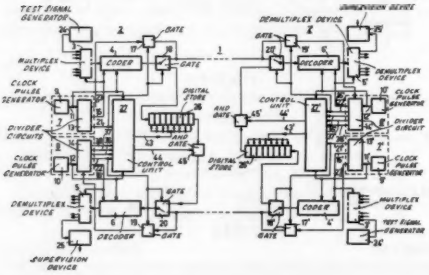
Leonardus Petrus Jozef Van Dijk; Jan Verhagen, both of Hilversum, Netherlands; Georg Feutsch, Dietikon, Switzerland, and Geerlof Jan Korevaar, Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 6, 1972, Ser. No. 215,818

Claims priority, application Netherlands, Jan. 8, 1971, 7100210

Int. Cl. H04j *3/14*

U.S. Cl. 179—15 BF **5 Claims**



A time division multiplex PCM transmission system in which the coder and decoder present in one and the same terminal station are supervised on conversion accuracy with the interposition of a test signal generator connected to at least one of the incoming channels, a digital store arranged between coder output and decoder input, and a supervision device connected to at least one of the outgoing channels. The digital store is provided with a separate control unit controlling writing and reading of amplitude samples of the test signal converted into a coded form and selecting the consecutive writing and reading intervals in such a manner that they cannot overlap one another in spite of their mutually varying time relation.

3,787,629

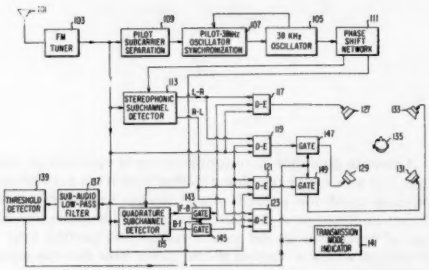
APPARATUS FOR DISTINGUISHING BETWEEN VARIOUS FM BROADCAST MULTIPLEX TRANSMISSIONS

Allen Le Roy Limberg, Lambertville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 9, 1972, Ser. No. 251,771

Int. Cl. H04h *5/00*

U.S. Cl. 179—15 BT **6 Claims**



A 38kHz flag subcarrier accompanying an FM multiplex transmission identifies whether such multiplex transmission includes two channel or surround stereophonic information. Apparatus to provide such a flag subcarrier comprises, for example, a source of direct potential to unbalance a then unused balanced quadrature subchannel modulator within the transmitter during two channel transmission. Receiver apparatus to detect the transmission of such a flag subcarrier comprises a threshold detector coupled by a subsonic low pass filter to the corresponding synchronous subchannel detector. Indicating and/or automatic switching apparatus responsive to the detector output is provided.

3,787,630

TIME DIVISION COMMUNICATION SYSTEM

Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

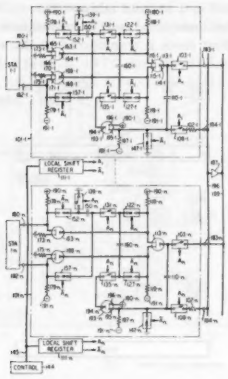
Filed July 31, 1972, Ser. No. 276,896

Int. Cl. H04j *3/02*

U.S. Cl. 179—15 AT **22 Claims**

A time division communication system wherein a plurality of time slots occurs in repetitive cycles includes a plurality of stations, first and second buses, a control signal source and a coupling circuit operative in each time slot to sum all signals applied to the second bus and to apply the resultant signal to the first bus. Each station has an associated circuit including first, second and third stores. The first bus signal is applied to the first store in response to the control signal. The first store signal is coupled via a first coupler to the second store and via a second coupler to the station and the third store. The third store also receives the station outgoing signal. In response to the control signal, the second and third stores are disconnected from the first and second couplers; the second and

third stores are connected series opposing; and the station outgoing signal from the third store is applied to the second bus and the first store wherein it is subtracted from the first bus



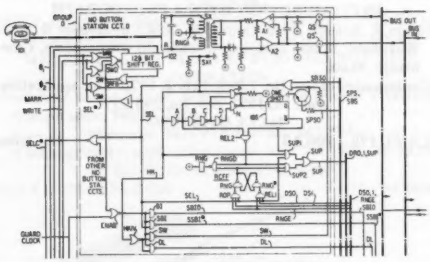
signal. The control signal is applied to the selected station circuits in a distinct time slot whereby signals are exchanged among the selected stations.

3,787,631

TIME SLOT NUMBER COMPENSATING ARRANGEMENT

Theras Gordon Lewis, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 11, 1972, Ser. No. 313,953
Int. Cl. H04q *3/54*
U.S. Cl. 179—15 AT **5 Claims**



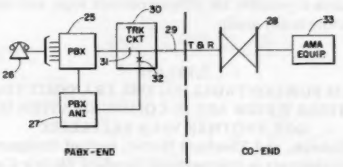
An electronic key telephone system is disclosed in which connections among the station sets and telephone lines are made in a central time division switching network remote from the station sets. Each station set and line is equipped with a port circuit having an individual shift register for defining the time slot interval during which a connection may take place. To assign a time slot to a port circuit, the main controller interrogates the network to find an idle time slot, registers in a time slot reporting register the time slot count accruing when an idle time slot is detected, and then furnishes that time slot number to the network controller. The time slot reporting register is equipped with a downcounter to compensate for the time it takes to prepare a port shift register to accept the circulating bit that assigns the port to the specific time slot.

3,787,632

AUTOMATIC NUMBER IDENTIFICATION FOR PRIVATE TELEPHONE EXCHANGES

Charles Colin Male, Stittsville, and John Melvin Wallis, Hazeldean, both of Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed June 28, 1971, Ser. No. 157,344
Int. Cl. H04q *3/72*
U.S. Cl. 179—18 FH **6 Claims**



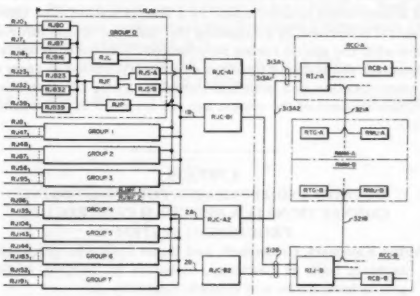
An automatic number identification system for identifying the calling station of a branch telephone exchange and transferring the information via the normal talking path connection through the central office. Briefly, the invention provides for the connection of the calling station to the central office for the dialling of a called number; disconnection of the station after the called number is transmitted to the central office; connection of the calling station identification apparatus to the central office for transmission of the calling station identity; followed by disconnection of the identification apparatus and reconnection of the calling station. Various alternative arrangements are described for adapting the invention to the various switching systems, accounting systems and whether "ground" or "loop" start is used.

3,787,633

MULTIPLEXING ARRANGEMENT FOR A COMMUNICATION SWITCHING SYSTEM

John E. Busch, Claredon Hills, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 30, 1972, Ser. No. 311,027
Int. Cl. H04m *3/00*
U.S. Cl. 179—18 J **16 Claims**



The register-sender subsystem comprises duplicated common logic and memory, and a maximum of 192 register junctors. Each register junctor is assigned an individual time slot in a time division multiplex cycle. The junctor multiplexing apparatus coupling the register-junctors to the common logic is not duplicated; but to minimize the effect of a gate failure the multiplexing apparatus is divided into eight separate groups each providing multiplexing circuits for 24 register-junctors. The groups are designed to be independent of one another.

Multiplexing provides for control signals from the common logic to set control latches in buffers of the individual register-junctor during their time slots; and scan signals from the register-junctors set scan latches in the multiplex circuits with eight scan latches in each group, each serving three junctors with OR circuitry from three junctors before the scan latch, and duplicated OR circuitry following the scan latches. The system is normally configured so that one common logic unit serves junctors in even-numbered multiplex groups and the other serves junctors in odd-numbered groups. Reconfiguration makes it possible for either common logic unit to serve the junctors in any group.

3,787,634

SYSTEM FOR CONTROLLING THE TRANSMIT TIME OF STATIONS WHICH ARE IN COMMUNICATION WITH ONE ANOTHER VIA A SATELLITE

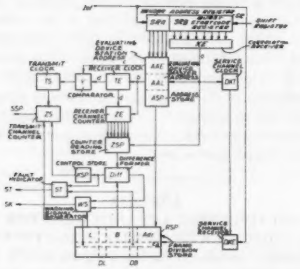
Heinz Haberle, and Eberhard Herter, both of Stuttgart, Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 83,912, Oct. 26, 1970, abandoned. This application Oct. 13, 1972, Ser. No. 297,554

Claims priority, application Germany, Nov. 12, 1969, P 19 56 867.3

Int. Cl. H04j *3/06*

U.S. Cl. 179—15 BS **8 Claims**



This relates to timing control of message bursts in a TDMA communication satellite system. Each ground station stores information as to both its time slot of transmission and duration of transmission as determined by a master station. The timing control is derived by comparing the received timing information with the stored timing information. When a difference is detected, the transmit timing is altered as required to carry on communication and maintain complete frame fill even when certain stations of the system are not involved in communication.

3,787,635

METHOD AND APPARATUS FOR MONITORING CONNECTIONS IN A PROGRAM CONTROLLED PROCESSING SYSTEM

Anton Kammerl, Grobenzell, and Hasso Steigenberger, Unterhaching, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

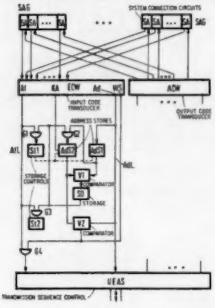
Filed Apr. 19, 1972, Ser. No. 245,551

Claims priority, application Germany, Apr. 19, 1971, P 21 18 930.0

Int. Cl. H04m *3/12*

U.S. Cl. 179—18 ES **4 Claims**

A method and apparatus for monitoring system connection units in program controlled telecommunications exchange systems to determine which units are producing connection requirements is described. Incoming and outgoing connections are identified over input and output code transducers. A storage cell in the central memory is permanently assigned to each incoming connection, and this storage cell can be accessed on the basis of the identification process carried on in the input code transducer. An operating cycle is simultaneously requested, and the system connecting unit generating a requirement is interrogated. The address of the system connection unit producing a request is identified and placed in a first address store. The address of an immediately preceding request is placed in a second address store. The contents of the two stores are compared, and in case of lack of identity the address in the first store is transferred to the second store. If



identity is determined, an indication thereof is forwarded to a store for continuous requirements, and this causes the production of a signal for blocking the inputs to the second address store. A second comparison process then takes place between the address in the second address store and the addresses which are assigned to the succeeding connection requests. In case of a determination of identity in this second comparison process the connection requirement is blocked from being forwarded to the transmission sequence control and an advancing signal arrives at the input code converter.

3,787,636

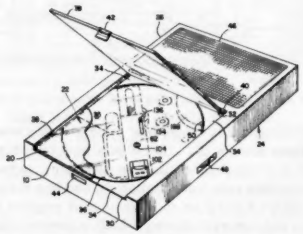
MAGNETIC RECORDING AND PLAYBACK SYSTEM FOR USE WITH RECORDING RECORDS ADAPTED FOR USE IN CONJUNCTION WITH A PHOTOGRAPH

Edison R. Brandt, Boca Raton, Fla., and Christopher R. Rice, Wakefield, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 7,809, Feb. 2, 1970. This application Apr. 18, 1972, Ser. No. 245,277

Int. Cl. G11b *21/06*

U.S. Cl. 179—100.2 T **11 Claims**



Magnetic sound recording and reproducing system incorporating a rectangular recording member having a planar face within which is formed a spirally grooved track. A magnetic recording surface surrounds the spiral track and the member is arranged for attachment to the rearward side of a photograph. The recording member is receivable within a recording-playback unit which rotates a magnetic head about the

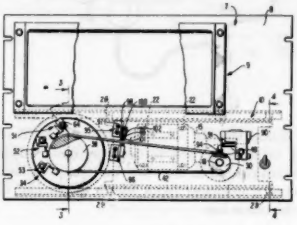
magnetic recording surface of the recording member. The locus of the magnetic head is established by a connection of a follower pin with a spiral track.

3,787,637

ANNOUNCING SYSTEM

John O. McCarty, Atlanta, and Leary W. Smith, Chamblee, both of Ga., assignors to The Audichron Company, Atlanta, Ga.

Filed July 26, 1971, Ser. No. 165,902
Int. Cl. G11b *5/74, 5/56, 23/18*
U.S. Cl. 179—100.2 MD **7 Claims**



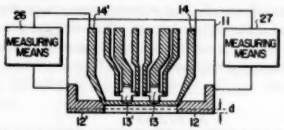
An announcing system for providing recorded messages to a telephone system comprising a driving pulley, a driven pulley, an endless record belt extending about the pulleys, a flywheel connected to the driven pulley, a motor connected to the driving pulley, and dampening means for dampening the motor vibrations from the driven pulley. A plurality of banks of reading heads are mounted adjacent the driven pulley and are arranged to read the message tracks on the record belt as the record belt moves about the driven pulley, and switches are actuated by depressions in the record belt as the depressions pass around the driving pulley. The switches connect and disconnect the telephone system to the reading heads in timed relationship with the messages imposed on the record belt.

3,787,638

HALL ELEMENT MAGNETIC HEAD HAVING INTEGRAL MEANS FOR DETECTING THE AMOUNT OF HEAD MATERIAL GROUND AWAY DURING A MACHINE OPERATION

Masayuki Murai, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 25, 1972, Ser. No. 247,294
Claims priority, application Japan, Apr. 29, 1971, 46/28393
Int. Cl. G11b *5/38, 5/42, 5/46*
U.S. Cl. 179—100.2 CH **8 Claims**



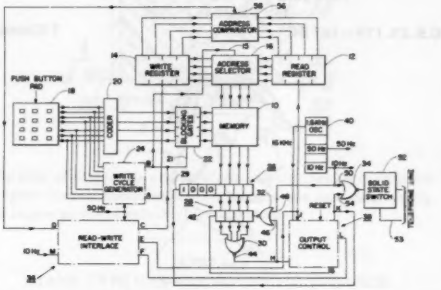
A magnetic head having one or more magneto-electric converting elements, for example, a Hall element, comprises one or more leads which are used, when the magnetic head is manufactured, for measuring the amount of head material ground away from between a front surface of the magnetic head and the front edge of the magneto-electric converting element.

3,787,639

PUSHBUTTON ELECTRONIC PULSING DIAL

Peter Edward Battrick, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Nov. 16, 1972, Ser. No. 307,064
Int. Cl. H04m *1/30*
U.S. Cl. 179—90 K **14 Claims**



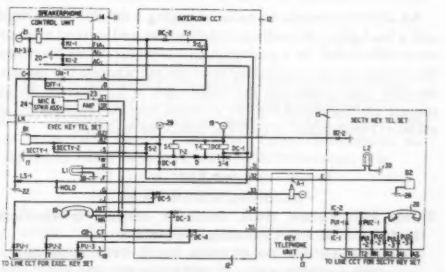
An electronic pushbutton dial, which generates dial pulse type signals on a telephone line in response to a digit selected on a pushbutton pad, for signalling step-by-step switching offices. The digit selected is coded and stored in a non-destructive read-write memory and is subsequently loaded into a presettable counter. A pulse generator is arranged to generate and feed dial-pulse-timing signals simultaneously into the presettable counter and to a solid state switch which is in series with the telephone line. The digit selected is transmitted to the central office by interrupting the telephone line current at the dial-pulse-timing signal rate until the count in the presettable counter reaches a predetermined value. The interdigit interval is generated by loading a fixed number into the presettable counter and feeding dial-pulse-timing signals into the presettable counter, while disabling the solid state switch, until the count in the presettable counter again reaches said predetermined value.

3,787,640

KEY TELEPHONE INTERCOM CIRCUIT

Stanley Edward Bush, and Kenneth Joseph Roberge, both of Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 26, 1972, Ser. No. 318,188
Int. Cl. H04m *1/00*
U.S. Cl. 179—99 **10 Claims**



A key telephone arrangement for controlling intercom and speakerphone connections over an intercom line, wherein a

single nonlocking key is utilized for establishing, signalling, and releasing the intercom connections, as well as for activating and deactivating the speakerphone.

3,787,641

BONE CONDUCTION MICROPHONE ASSEMBLY

Charles M. Santori, San Jose, Calif., assignor to Setcom Corporation, San Jose, Calif.

Filed June 5, 1972, Ser. No. 259,489

Int. Cl. H04r *25/00*

U.S. Cl. 179—107 BC **7 Claims**

A bone conduction microphone assembly with a transducer mounted in a transducer mount supported from a surrounding support member by spring means which yieldably urges the transducer mount against the user's head with predetermined pressure.

3,787,642

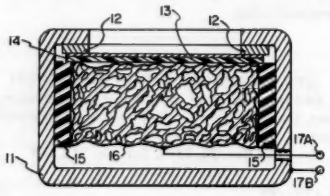
ELECTROSTATIC TRANSDUCER HAVING RESILIENT ELECTRODE

Robert F. Young, Jr., Northfield, Ill., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Sept. 27, 1971, Ser. No. 183,899

Int. Cl. H04r *19/00*

U.S. Cl. 179—111 E **23 Claims**



An electro-acoustic transducer having a flexible diaphragm and a backplate of resilient construction and a front element of metalized foil. In a preferred embodiment of the invention the transducer is a condenser microphone wherein the insulating film that comprises the diaphragm is an electret. In alternate embodiments the foil element may be replaced by an element constructed of resilient foam-like material.

3,787,643

HEARING AID DEVICE

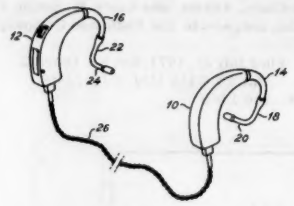
Torben Elof Nielsen, Holte, Denmark, assignor to American Danish Oticon A/S, Copenhagen, Denmark

Continuation of Ser. No. 882,150, Dec. 4, 1969, abandoned. This application Nov. 7, 1972, Ser. No. 304,314

Int. Cl. H04r *25/02*

U.S. Cl. 179—107 E **6 Claims**

The present invention relates to a hearing aid device having a sound receiving transducer with an acoustic inlet in the form of a relatively narrow aperture and means for locating said sound receiving transducer in a position relatively to the head of the user with the acoustic inlet being located substantially at a zone of the ear where increased sound pressure is built up



in response to sound signals received. The signals from the signal receiving transducer are through suitable adjustable amplification means routed to the other ear and processed in a sound reproducing transducer from which the sound signals are supplied to the other ear.

3,787,644

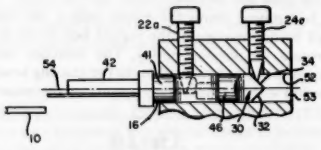
MAGNETIC HEAD ADJUSTMENT ASSEMBLY

Guenter E. Schneider, Concord, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed July 12, 1972, Ser. No. 271,135

Int. Cl. G11b *5/56*

U.S. Cl. 179—100.2 CA **5 Claims**



Alignment apparatus for a pair of transducers in a magnetic memory having a single magnetic disk. An elongated mount for each transducer extends along a normally horizontal suspension axis. The two mounts are spaced vertically in a carriage to position the respective transducers adjacent opposite disk surfaces. Each mount has a semi-cylindrical positioning surface on which a pair of flats are formed. Radially extending lugs with semi-cylindrical surfaces and the positioning surface constitute a cylinder which fits in a bore in the carriage. A positioning screw and locking screw are oriented to engage a wedging surface and a flat associated with the upper mount. Another positioning screw and locking screw are vertically offset from lugs on the upper mount. They engage a wedging surface and flat of the lower mount because it is rotated 180° with respect to the upper mount.

3,787,645

ECHO CANCELLER HAVING TWO ECHO PATH MODELS

Kazuo Ochiai, and Takashi Araseki, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed May 17, 1972, Ser. No. 254,071

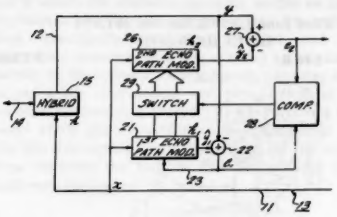
Claims priority, application Japan, May 19, 1971, 46/33858; Aug. 13, 1971, 46/61736

Int. Cl. H04b *3/20*

U.S. Cl. 179—170.2 **6 Claims**

An echo canceller having self-adaptive means retaining a first echo path model is comprised of means retaining a

second echo path model, means for subtracting the output signal of the second echo path model means from the send-in signal to produce the send-out signal, means for comparing the first and the second echo path models, and means responsive to the results of comparison for transferring the echo path model from one of the first and the second echo path model means to the other.

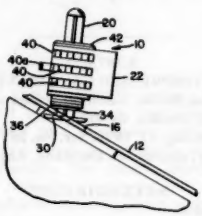


3,787,646

DIAL TELEPHONE LOCK

James S. Kalfsbeek, College City; Peter C. Kalfsbeek, and Robert S. Goodrich, both of El Segundo, all of Calif., assignors to James S. Kalfsbeek, College City and Peter C. Kalfsbeek, Williams, both of, Calif.

Filed Apr. 18, 1972, Ser. No. 245,067
Int. Cl. H04m *1/66*
U.S. Cl. 179—189 D **11 Claims**



A dial telephone locking device having a shaft extending through a combination lock mechanism. One end of the shaft has an elongate foot for engagement in a hole in the dial. The shaft is transversely movable in the combination lock when the lock is open, but such movement is prohibited when the lock is locked. Thus, the foot may be received in the hole in the dial when the lock is open, and the shaft thereafter drawn inwardly through the lock body to center the foot in abutting engagement beneath the hole with the lock body abutting the other side of the dial. The lock protrudes above the telephone dial and thereby prevents rotation of the dial beyond the finger stop.

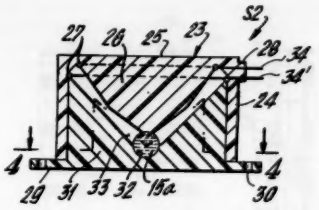
3,787,647

CONDUCTING FLUID TYPE GRAVITY SAFETY SWITCH WITH SPIRAL CONTACTS

Benjamin F. Hughes, Rt. 1, Box 120, Morris, Ala.

Filed July 7, 1972, Ser. No. 123,987
Int. Cl. H01h *35/02*
U.S. Cl. 200—61.47 **8 Claims**

An improved gravity operated switch includes a movable electrically conductive member in a housing normally on a central seat when in a normal horizontal position out of the circuit. When the housing is tilted, the movable conductive member moves out of the seat to bridge a pair of fixed spaced electrical contacts in an associated electrical circuit to control the flow of fuel to the engine of the vehicles, ignition, or other engine control components. The switch has particular utility in engine powered vehicles, such as tractors.

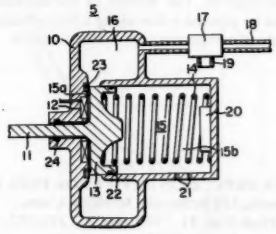


3,787,648

TANK-TYPE GAS-BREAK CIRCUIT BREAKER

Kikuo Kawasaki, Kawasaki, Japan, assignor to Fuji Denki Seizo Kabushiki Kaisha, Kawasaki-shi, Japan

Filed Dec. 29, 1971, Ser. No. 213,456
Claims priority, application Japan, Dec. 29, 1970, 45-127251; Dec. 29, 1970, 45-127254
Int. Cl. H01h *33/86*
U.S. Cl. 200—148 J **7 Claims**



The break contacts in a tank-type gas-break circuit breaker are disposed in a high-pressure gas chamber formed in a sectionalized state within a tank constituting a low-pressure gas chamber and are coupled via an operating rod of insulative material passing through the low-pressure gas chamber to a piston of a piston mechanism disposed outside of the tank, a driving device operating in response to a tripping command to impart an initial impulsive driving force for opening the break points to the piston.

3,787,649

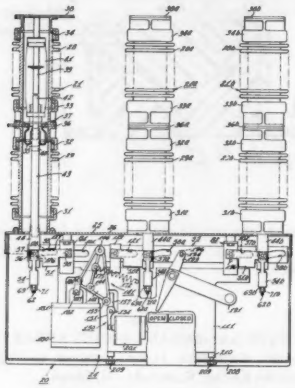
VACUUM SWITCH CAM OPERATING MECHANISM WITH CONTACT LOADING COMPRESSION SPRING

Edwin C. Goodwin, Jr., Canton; Oscar L. Larkin, Saugus, both of Mass., and Heinrich H. Erni, Turgi, Switzerland, assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 4, 1972, Ser. No. 278,177
Int. Cl. H01h *33/42, 33/66, 3/42*
U.S. Cl. 200—153 LA **20 Claims**

A single reciprocable cam bar simultaneously operates three vacuum interrupters. Cam follower motion is transmitted by precompressed contact loading springs to the movable contacts to assure high contact pressure, and the precompressed contact laoding springs exert substantially constant force regardless of the amount of contact erosion or overtravel. The cam bar is latched in switch closed position, and

the forces of the three contact loading springs are additive to the force of the cam bar return springs to effect switch opening. Contact closing position is adjustable for each switch at a single point by varying deflection of the precompressed con-



tact loading springs to thereby assure synchronized closing of the three interrupters. The motion of the contact operating rods is guided by pivoted yokes along a line substantially axial of the contacts to compensate for contact erosion.

3,787,650

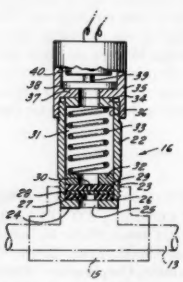
WATER DETECTION DEVICE FOR FUEL LINE

Warren J. Lewis, 132 Britannia, Meriden, Conn.

Filed Sept. 21, 1972, Ser. No. 291,073

Int. Cl. H01h *35/38, 35/00*

U.S. Cl. 200—61.04 **3 Claims**



A warning mechanism is used to indicate the presence of an impurity in a tube carrying a fluid, for example, to warn of water in a hydrocarbon fuel line. The mechanism includes a thin plastic disk which is insoluble in the fluid but soluble in the impurity, a chamber filled by the mixture after partial dissolving of the disk, and a pressure responsive transducer.

3,787,651

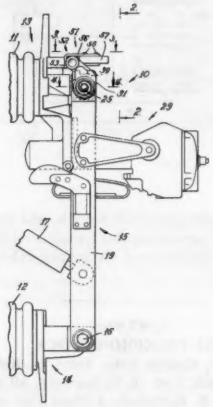
HIGH VOLTAGE SWITCH WITH HIGH CURRENT CLOSING CONTACTS

Leonard V. Chabala, Maywood, and David M. Evans, Palatine, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed June 8, 1972, Ser. No. 261,074

Int. Cl. H01h *33/12*

U.S. Cl. 200—146 R **3 Claims**



A high voltage switch for closing on high current flow has a pair of arcing contacts spaced apart at the distal end of a switch blade for engaging therebetween a graphite arcing tip prior to engagement by the switch blade of a stationary metallic contact.

3,787,652

ELECTRIC COMPRESSED GAS CIRCUIT BREAKER

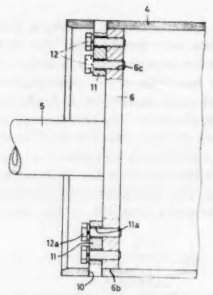
Wolfgang Konczal, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 17, 1972, Ser. No. 281,495

Claims priority, application Germany, Aug. 31, 1971, P 21 44 215.9

Int. Cl. H01h *33/88*

U.S. Cl. 200—148 A **6 Claims**



An electric compressed gas circuit breaker has cooperating stationary and movable contacts and an arc blasting assembly including a stationary blast piston and cooperating therewith, a blast cylinder made of electrically insulating material and having a bottom to which the movable contact is mounted.

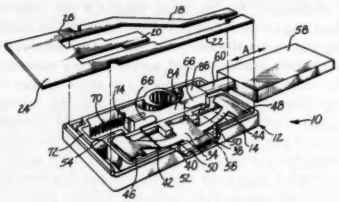
During circuit breaking, the cylinder's bottom is moved to separate the contacts, the cylinder having an end provided with a nozzle which, due to the cylinder's simultaneous movement relative to the stationary piston, further compresses the gas in which the assembly operates, so that an arc extinguishing blast is ejected through this nozzle. The cylinder is made from electrically insulating material and the bottom removably connects with the cylinder's end remote from its nozzle, by the cylinder's inside having a keyway and its bottom having a key cooperating with this keyway in a removable manner. Preferably a plurality of keyways and keys are provided which are circumferentially interspaced uniformly so that the mechanical stress resulting from the transmission of force between the bottom and the cylinder is distributed uniformly throughout the cylinder.

3,787,653

ELECTRICAL SWITCH ASSEMBLY

Robert L. Maher, Somers, N.Y., assignor to Donald P. Mossman, Inc., Brewster, N.Y.

Filed Nov. 24, 1971, Ser. No. 201,640
Int. Cl. H01h *15/24*
U.S. Cl. 200—153 K **7 Claims**



An electrical switch assembly having a non-conductive switch body and three spaced conductor strips mounted therein is provided with a rockable contact member positioned adjacent the conductor strips for selectively bridging contact zones thereon. The contact member has first and second contact elements at opposite ends thereof, with first and second conductor strips disposed in the body to be engaged with the first contact element in one position of the contact member and the first and third conductor strips disposed to be engaged with the second contact element in another position of the contact member. In one embodiment, manually operable means is provided for selectively rocking the contact member between its respective positions to selectively engage or disengage the contact elements with their associated conductor strips.

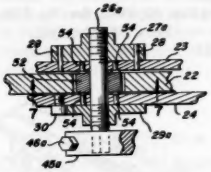
3,787,654

BOLTED CONTACT SWITCH WITH CAM MEANS FOR OVERCOMING MAGNETIC PINCH FORCES ON CONTACT BLADES

Tadeusz J. Rys, Monroe, Ohio, assignor to Square D Company, Park Ridge, Ill.

Filed Feb. 26, 1973, Ser. No. 336,147
Int. Cl. H01h *1/50*
U.S. Cl. 200—170 A **1 Claim**

Two flat movable contact blades are mounted adjacent first ends thereof in spaced parallel relationship respectively on opposite sides of a flat stationary mounting blade for edgewise pivotal movement of their other end portions into and out of engagement respectively with opposite sides of a flat stationary contact blade aligned with the mounting blade. Threaded stud and nut clamping means are provided for automatically clamping the movable contact blades adjacent opposite ends respectively to the mounting blade and to the stationary contact blade after the movable contact blades reach a fully closed position. Cam means carried by the movable contact



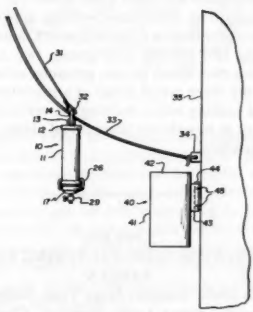
blades overcomes static friction and high magnetic forces to prevent welding of the blades in closed position upon flow of excessively high currents.

3,787,655

METHOD OF UNDERWATER WELDING

Dale R. Anderson, Zachary, La., and Conway E. Grubbs, Glenn Ellyn, Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed June 5, 1972, Ser. No. 259,544
Int. Cl. B23k *9/16*
U.S. Cl. 219—72 **8 Claims**



Flux-coated electrodes pressure equalized to an underwater welding depth in contact with a fluid other than water before the electrodes are contacted with water at the welding site are used in wet welding.

Flux-coated electrodes are preconditioned by pressurizing them in a fluid other than water to a pressure substantially equal to an underwater pressure where the electrodes are to be used in wet welding.

At a location above sea level, placing a plurality of flux-coated welding electrodes in a water proof container containing a fluid other than water, delivering the container to an underwater welding site with the electrodes in the container substantially pressurized to the pressure at the welding site, and removing the electrodes from the container at the welding site and placing the electrodes in a storage chamber adjacent the welding site, said storage chamber containing a fluid, other than water, at a pressure substantially equal to the underwater pressure at the welding site.

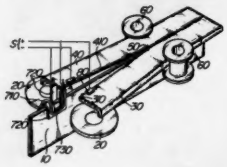
An electrode pressure preconditioning container having walls capable of withstanding pressure equal to the pressure at an underwater welding site, a removable closure for closing an opening in the container, a conduit outside the container communicating with the container interior space, and a valve in the conduit.

3,787,656

CONTINUOUS WELDING METHOD AND APPARATUS THEREOF FOR METAL PLATES

Tatsuji Matsumoto, 7-96 Sakurazuka Hondori, Toyonaka-shi, Osaka-fu, Japan

Filed Feb. 22, 1972, Ser. No. 228,131
Int. Cl. B23k *1/02*
U.S. Cl. 219—104 **2 Claims**



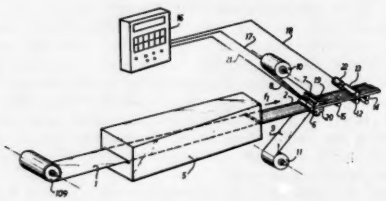
The continuous welding method comprised the steps of feeding or forwarding three metal plates continuously together with approaching them one another so as to unite them at the predetermined position through a high frequency induction heating device and contractors positioned in front of the uniting position, passing the feeding metal plate vertically through the high frequency induction heating device of a predetermined width without contacting them each other, and advancing the two remaining metal plates with contacting the welding end edges of the remaining metal plates with the contractors so as to weld the three metal plates one another at the uniting position. The continuous welding apparatus for three metal plates comprises a high frequency induction heating device having two heating side plates, two contractors arranged on the two metal plates, pressure rollers integrating and uniting the three metal plates at a predetermined uniting position, and holding rollers holding the vertical plate in vertical position so as to weld the three metal plates one another at the uniting position.

3,787,657

APPARATUS FOR MANUFACTURING SANDWICH PANELS

Jean Francois Denis, Lesigny; Serge Yvan Ozalba-Lyndis, Villejuif; Maurice Henri Louis Fremont, Clamart; Edward Krajewski, Yerres, and Jean-Pierre Julien Marcel, Morland, Clamart, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Mar. 2, 1973, Ser. No. 337,422
Claims priority, application France, Mar. 3, 1972, 7207583
Int. Cl. B23k *9/02*
U.S. Cl. 219—117 HD **14 Claims**



A welding machine for fabricating metal sandwich panels having corrugated core, comprising a set of rules for offering up the core, TIG welding blowpipes positioned in a channel at the location where the core is covered with skin strip, HF-ignition welding generators, HF gencrators in immediate vicinity to the blowpipes, a weld sequencing block, said machine being disposed in order that the core strip is covered subsequent to being corrugated and is then welded beneath the TIG welding blowpipes, electrodes being positioned outside the core.

3,787,658

TUBULAR ARC WELDING ELECTRODE

Paul A. Kammer, Springettsbury Township, York County, and Robert B. Duttera, Springfield Township, York County, Pa., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Nov. 3, 1971, Ser. No. 195,486
Int. Cl. B23k *35/22*
U.S. Cl. 219—146 **5 Claims**

A bare continuous tubular electrode consisting of a metallic outer sheath and a core within and enclosed by the sheath, the electrode consisting essentially of, by weight: 0.05 to 0.36 per cent. of at least one fluxing agent selected from the group consisting of lithium fluoride, cryolite, potassium silicofluoride and sodium silicofluoride; 0.01 to 1.8 per cent. in total of slag former selected from the group consisting of titanium dioxide, potassium permanganate, sodium feldspar, zirconium silicate, calcium silicate, magnesium oxide, manganese oxide and calcium carbonate, but no more than 1.2 per cent. of any individual slag former; 0 to 0.012 per cent. of arc stabilizer comprising potassium titanate; the balance of the electrode being metal-bearing material; said metal-bearing material containing, by weight of the electrode, 1.5 to about 10 per cent. alloying ingredients and deoxidizer, said alloying ingredients and deoxidizer comprising 0.6 to 1.8 per cent. manganese and 0.25 to 0.9 per cent. silicon, the balance of the metal-bearing material being essentially iron. The fluxing agent desirably comprises 0.12 per cent. cryolite and the slag former desirably includes titanium dioxide, sodium feldspar, zirconium silicate and calcium silicate. The electrode preferably contains up to 0.2 per cent. carbon, 0 to 4 per cent. nickel, 0 to 6 per cent. chromium and 0 to 1.3 per cent. molybdenum. The fluxing agent may be selected from lithium fluoride, potassium silicofluoride and sodium silicofluoride and the slag former may comprise 0.024 per cent. calcium carbonate while the electrode may contain up to 0.2 per cent. carbon, 0 to 4 per cent. nickel, 0 to 6 per cent. chromium and 0 to 1.3 per cent. molybdenum.

3,787,659

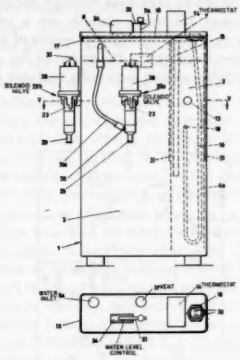
APPARATUS FOR SUPPLYING EITHER HOT OR WARM WATER IN A VENDING MACHINE

Frederik Walraven Olland, Bilthoven, Netherlands, assignor to Olland Industrie-en Handelmaatschoppij N.V., DeBilt, Netherlands

Filed Jan. 12, 1972, Ser. No. 217,101
Claims priority, application Netherlands, Aug. 17, 1971, 7111342
Int. Cl. H05b *1/00*; F24h *1/20*
U.S. Cl. 219—314 **4 Claims**

A machine for vending warm drinks selectively (*a*) by extracting extractable ingredients and (*b*) by dissolving soluble ingredients comprises an apparatus for supplying both hot water for extracting and warm water for dissolving. A tank for holding a supply of warm water is separated from a substantially smaller second tank for holding a supply of hot water by a heat-conducting wall. An electrical heating coil in the second tank is provided with a thermostatic control responsive to the water temperature in the second tank for maintaining said water temperature slightly below the boiling point. Means are provided for maintaining the transfer of heat from the second tank to the first tank at rate such as to maintain a water temperature of 70°–75° C. in the first tank when the water

temperature in the second tank is slightly below the boiling point. A valve-controlled outlet is provided for withdrawing



hot water from the second tank for extracting, and a separate valve-controlled outlet is provided for withdrawing warm water from the first tank for dissolving.

3,787,660

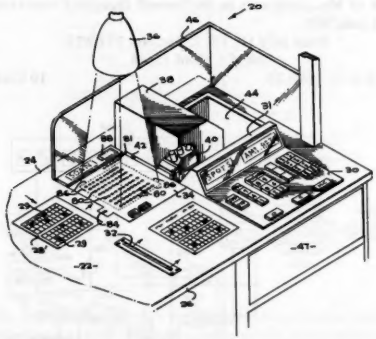
GAME CONTROL SYSTEM

Laverne H. Meyers, Newport Beach, Calif.; Frank L. Kagele; Edward J. Trent, both of Reno, Nev.; Jerry T. Fridenberg, Westminster, Calif.; Frederick J. Alberty, Hollywood, Calif., and Bloyce D. Fitzgerald, Long Beach, Calif., assignors to said Intercontinental Services, Inc., by said Kagele, Meyers, Trent, Fridenberg and Alberty, Sparks, Nev.

Filed Nov. 16, 1971, Ser. No. 199,222

Int. Cl. G06k *3/02*

U.S. Cl. 235—61.9 R **31 Claims**



A system is disclosed for expediting and monitoring customer transactions in the game of keno including a plurality of transaction terminals or stations each including scanner means for sensing marked number spots of a customer marked keno ticket, a manually operable keyboard for receiving entries of the price of a transaction and the nature of the transaction and a duplicate receipt ticket providing means including printing means controlled by the scanner and the keyboard for rapidly providing a duplicate ticket with brush mark replicas in the same number spots as those of the customer marked ticket and for also imprinting additional information such as the nature and price of the transaction. Another aspect of the invention resides in the provision of a control and data processing system interconnecting the plurality of terminal stations to a central control for controlling and monitoring all of the transaction terminals and storing all transactions of all transaction terminals. An additional feature resides in the provision of a back printer for imprinting the back of a customer marked ticket with all information, such as the amount of the transaction and the nature of the transaction, imprinted on the receipt ticket.

3,787,661

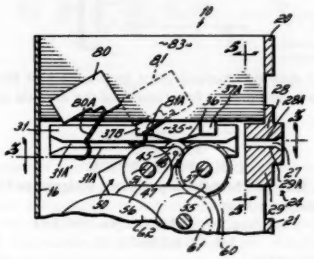
MAGNETICALLY ENCODED CARD READER AND/OR WRITER

Charles J. Moorman, Cincinnati; Martin R. Meyer, Mt. Healthy, and Frederick A. Reuter, Cincinnati, all of Ohio, assignors to The Mosler Safe Company, Hamilton, Ohio

Filed May 30, 1972, Ser. No. 258,017

Int. Cl. G06k *7/08, 13/08;* **G11b** *5/48;* **B65h** *29/00*

U.S. Cl. 235—61.11 D **1 Claim**



A reader and/or writer for magnetically encoded cards including a frame structure, a guide assembly for guidably supporting a card manually inserted into the reader, a transducer for reading and/or writing the magnetically encoded data on the inserted card, a pair of rolls underlying an inserted card and displaced laterally of, but symmetrical to, the transducer for supporting the card in the region thereof proximate the transducer, and a motor to drive one of the support rolls for returning the card to the user and effecting reading and/or writing thereof by the transducer.

3,787,662

VOTING MACHINE

Roy A. Martin, and Clarence E. Pittman, both of Atlanta, Ga., assignors to Lectra Data, Inc., Atlanta, Ga.

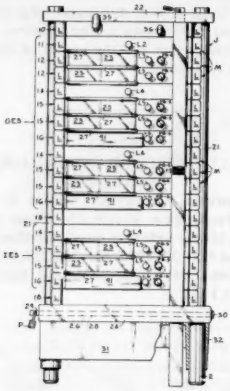
Division of Ser. No. 755,688, Aug. 27, 1968, abandoned. This application Apr. 28, 1972, Ser. No. 248,673

Int. Cl. G07c *13/00*

U.S. Cl. 235—54 F **15 Claims**

Apparatus for selectively producing electrical pulses representative of a particular selection made by the operator of the apparatus. The apparatus is disclosed in the form of a voting machine built up of modular components which fit together to form any of a plurality of different voting arrangements. The voting machine is substantially tamper-proof and has the following basic components: an input module, a frame assembly, a first control module, a first vote module, a second control module, a second vote module, a terminal module, a write-in module, a slave input module, and a third control module. The modules may be placed together in selected fashion to define a voting machine for voting in any type of political race and which will prevent overvoting. The difference modules fit together in such manner that they cannot

be separated without a key to unlock the same, thereby reducing the possibility of tampering with the election results. Moreover, each module is constructed in such manner that



the module may be checked prior to assembly of the voting machine to insure proper functioning of the module once it is assembled.

3,787,663

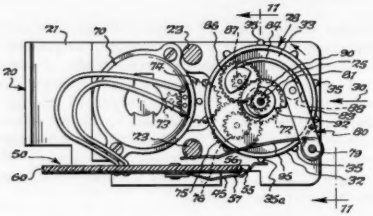
COUNTING DEVICE

Arthur W. Haydon, Middlebury, Conn., assignor to Tri-Tech, Inc., Waterbury, Conn.

Filed Nov. 10, 1971, Ser. No. 197,343

Int. Cl. H03k *21/16*

U.S. Cl. 235—92 C **8 Claims**



A transfer counter in which the higher order register drums are controlled by planetary gearing carried on flexible, resiliently biased transfer arms and in which lugs or depressions on the periphery of the drums actuate a series of switches to provide coded electrical signals which correspond to the angular positions of the drums. The switches are mounted on a single printed circuit read-out board for all of the drums which extends in a plane parallel to the drums' axis of rotation. The transfer of the drums is prevented during the electrical reading of the switches, and for resettable counters the switches are rendered inactive when the counters are being reset.

3,787,664

CURRENCY COUNT VERIFIER

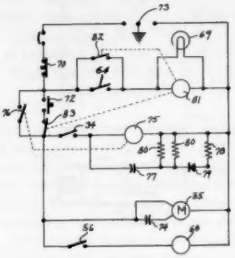
George V. Johnson, Oconomowoc, and Charles T. Bergman, Watertown, both of Wis., assignors to Brandt, Inc., Watertown, Wis.

Filed Apr. 28, 1972, Ser. No. 248,557

Int. Cl. G06m *7/06*

U.S. Cl. 235—92 SB **7 Claims**

A machine for verifying the quantity of bills in a stack of bills of the same denomination has a receiving compartment in which the stack of bills to be counted is placed. The bills are removed one at a time from the receiving compartment and are passed through a counting section and elevated up to a discharge compartment. The bills are counted by the actuation of a count switch as they pass through the counting section with the count recorded visually on a counter. The machine is set in operation by the depression of a start switch which will function to carry out the count of the stack of bills only if a stack switch is closed indicating that one or more bills



are present in the receiving compartment. The movement of the last bill of the stack out of the receiving compartment will open the stack switch but the circuit to operate the machine will remain energized for a sufficient time to permit the last bill of the stack to be transported to the discharge compartment. Overlapping, folded or double bills which would provide a false count are sensed in the counting section and a warning light alerts the operator to the fact that doubled bills have been counted. The operator must then depress a reset button before the machine can again be operated.

3,787,665

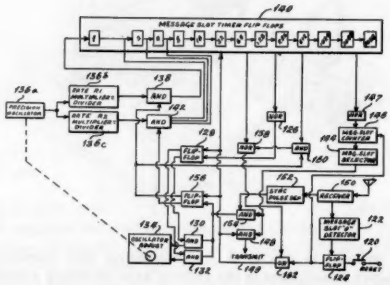
MEANS FOR SYNCHRONIZING REMOTELY POSITIONED TIMING DEVICES

Fred D. Watson, Ballwin, and John L. Mohr, Creve Coeur, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed July 17, 1972, Ser. No. 272,472

Int. Cl. G06f *15/48*

U.S. Cl. 235—150.23 **10 Claims**



Improvements in means for synchronizing remotely positioned timing devices including means to provide multiple error correction factors which are functions of the time error or time difference between the time keeping means in spaced systems or units being synchronized, said means being particularly useful in group synchronization by providing time convergence to a common synchronizing base. The use of multi-

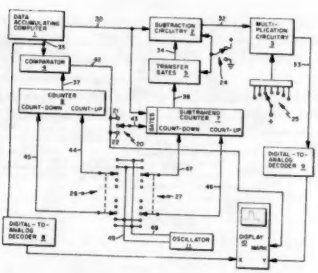
ple error correction factors restricts or limits relative timing errors between systems or units especially when in the process of changing from one reference time base location to another, and it provides means to bring timing devices at remote locations into closer synchronization on a continuing basis. The present means provide correction factors which are directly proportional to the synchronizing error including those cases where the correction versus error proportion is other than in a one-to-one relationship. This is especially advantageous in situations where there is a ground or master station responsibility that is shared on a rotating, shifting or location basis with other stations that are or may be synchronized but on a different time schedule or time base. Partial corrections in such situations can cause convergence of the synchronizing operation on a global or regional basis to a common time synchronization base and on a continuous and uninterrupted basis. The present means are also able to provide time synchronization of remotely located timing devices or units with or without the need to designate specific units or stations, or sets of units or stations, as masters and slaves. This means that the need for master or central accurately synchronized time references or stations which has characterized prior art time synchronized systems is no longer necessary.

3,787,666

INFORMATION DISPLAY SYSTEM

Robert W. Schumann, Madison, and Arthur F. Smith, Verona, both of Wis., assignors to Nicolet Instruments, Inc., Madison, Wis.

Filed Oct. 19, 1971, Ser. No. 190,583
Int. Cl. G06f *15/20*
U.S. Cl. 235—151 **31 Claims**



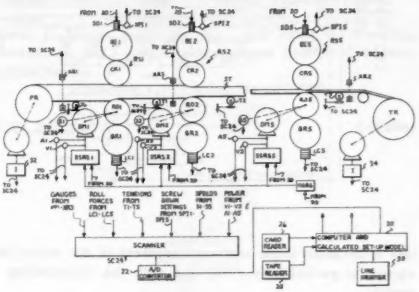
An information display system including display means for displaying a sequence of coordinate points, each point having an ordinate and an abscissa value. The system having means for subtracting a selectable constant from each ordinate value prior to display, and means for multiplying the difference of the subtraction before display. Pulse means are provided for selectively varying the constant to be subtracted at a selectable rate. Means are also provided for varying the multiplication factor. Also, means are provided for marking a coordinate point on the display means and for selectively using the ordinate value of the selected coordinate as the constant to be subtracted, thus centering or zeroing the displayed figures around the marked point. Finally, limit means are provided at the output of both the subtraction means and the multiplier means for providing maximum and minimum output numbers from each.

3,787,667

COMPUTER CONTROLLED METAL ROLLING MILL

William D. King, Elnora; George D. Larson, Schenectady; Donald E. Steeper, Rexford, and Amos J. Winchester, Jr., Schenectady, all of N.Y., assignors to General Electric Company, Salem, Va.

Filed Jan. 6, 1971, Ser. No. 104,382
Int. Cl. G06f *15/46;* **B21b** *37/14*
U.S. Cl. 235—151.1 **7 Claims**



A computer controlled cold metal rolling mill is described wherein force and power curves stored within a calculated set-up model are adapted in response to sensed on-line rolling conditions to optimize power distribution between stands of the mill. For maximum storage capacity and simplification of the adaptive feedback calculations, the power curves are stored in the set-up model by two numerals representing the slope and base of a graph of power per unit volume flow against elongation as plotted on log log-log scales. Thus, only the slope and base of the actual power curve need be calculated during operation to modify the power curves stored within the set-up model. Adaptation of the force curves within the model is accomplished in association with feedback logic for adjusting the value of the coefficient of friction (assumed for calculation of force) by an amount proportional to the difference between the observed and calculated force. Both fast and slow feedback terms are employed for this purpose with the fast feedback term approaching zero asymptotically as the slow feedback term approaches a coefficient of friction equating the measured and predicted forces. Integral scanning and comparison also are utilized to evaluate the quality of adaptive data before updating the stored curves. Also disclosed is the storage of mill stretch curves as functions of roll force against mill stretch for nominal constant roll force per unit width with a modifier being employed to correct for variations in force per unit width from nominal.

3,787,668

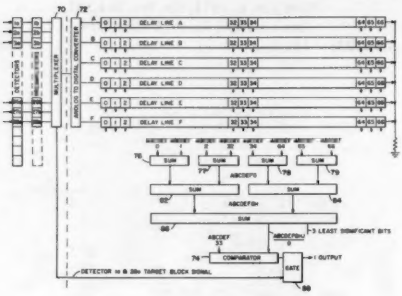
ADAPTIVE THRESHOLD UNIT

Richard W. Currie, and Teddy J. Peacher, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed Feb. 22, 1973, Ser. No. 334,826
Int. Cl. G06f *7/38, 15/34*
U.S. Cl. 235—152 **6 Claims**

In conjunction with an infrared detection device, the adaptive threshold unit eliminates much of the clutter or false targets in the field of view of the detection device. This is accomplished by converting received analog intensities which represent the true target and clutter into digital form and processing them in a special purpose digital processor. The digital processor passes target or possible target pulses only

from those field of view segments which have a higher intensity than the average intensity of the eight surrounding segments. Each segment of space subtends a one milliradian by



one milliradian angle and each segment of the sector being viewed is periodically compared with the surrounding segments.

3,787,669

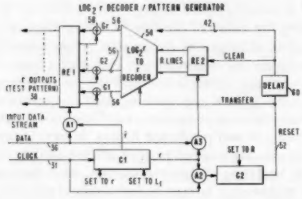
TEST PATTERN GENERATOR

Eugen Igor Muehldorf, Potomac, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1972, Ser. No. 267,875

Int. Cl. G06f 1/02

U.S. Cl. 235—152 **7 Claims**



A generic sequential digital pattern generator is disclosed for converting a serial data stream of *n* compacted pattern messages into a sequence of *n* parallel digital patterns. The generic invention comprises a decoding means connected to a serial data stream, for receiving a compacted pattern message and converting the message to a signal on one out of *r* decode lines, an output register having *r* binary storage cells connected to *r* output lines, and *r* modulo 2 adders in parallel. Each modulo 2 adder has an augend input and an addend input. Each augend input is connected to one decode line from the decoding means. Each addend input is connected to one input line from the register. When the decoding means receives a compacted pattern message, it executes a change in the binary state of a selected one of the *r* output lines. Two species of the invention are disclosed, a first digital pattern generator operating on a serial data stream of pattern messages compacted by a $\log_8 r$ encoding scheme, and a second digital pattern generator operating on a serial data stream of pattern messages compacted by the Shannon-Fano encoding scheme.

3,787,670

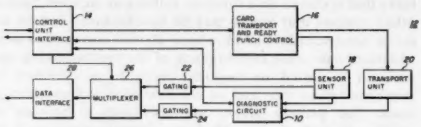
AUTOMATIC DIAGNOSTIC SYSTEM

Paul E. Nelson, Chelmsford, and Russell H. Peterson, Acton, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 20, 1971, Ser. No. 209,957

Int. Cl. G06f 11/04

U.S. Cl. 235—153 AC **16 Claims**



In a computer having a peripheral device and a central processor including a memory and an arithmetic unit, an anticipatory diagnostic system including a plurality of monitor units for observing operation of a peripheral device, gating means for selecting the monitor unit whose output is to be interrogated, means responsive to the gating means for quantizing the output of the selected monitor unit and means for storing the quantized output for redelivery to the central processor upon a subsequent command.

3,787,671

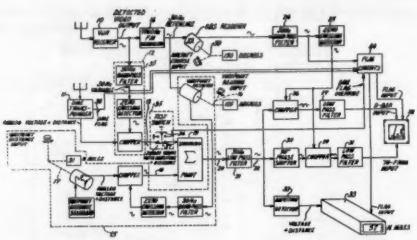
METHOD AND APPARATUS FOR TESTING AREA NAVIGATION COMPUTERS

Jerry C. Schmitt, Overland Park, Kans., assignor to King Radio Corporation, Olathe, Kans.

Filed Mar. 15, 1971, Ser. No. 124,299

Int. Cl. G06g 7/78

U.S. Cl. 235—150.26 **7 Claims**

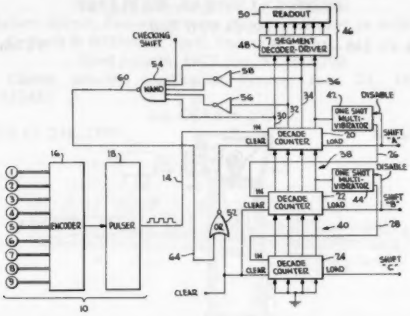


A method and apparatus for testing area navigation computers and systems which incorporate the use of a test switch within the computer circuit to either pass or interrupt signals which correspond to the location of the aircraft utilizing the subject area navigation computer. This switching function is accomplished prior to same being summed together with signals representative of the corresponding waypoint location. Interruption of the aircraft location signals to the summing point artificially places the aircraft over a corresponding VORTAC station. Accordingly, the output from a properly operating computer will equal the waypoint data which is normally used to manually program the computer. Additional switch means override circuitry which would normally indicate a malfunction of the DME signal used with the computer circuitry in order that the pilot's navigation displays are not rendered inoperative.

3,787,672
ELECTRONIC CALCULATING DEVICE HAVING ARITHMETIC AND ERROR-CHECKING OPERATIONAL MODES

John W. Stein, 17129 Chiswell Rd., Poolesville, Md.

Filed May 30, 1972, Ser. No. 257,544
Int. Cl. G06f *11/10*
U.S. Cl. 235—153 BD 5 Claims

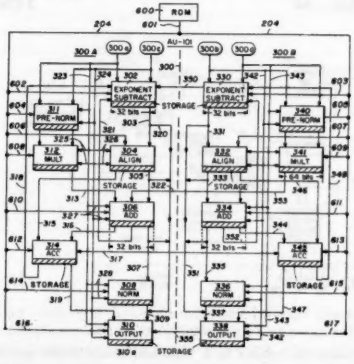


A novel portable hand-held electronic calculating device is disclosed, the calculating device having arithmetic and error-checking operational modes. The device incorporates a keyboard having a plurality of keys thereon representative of different integers such as in the usual base 10 numeral system. Actuation of a key effects generation of an electrical pulse output. A conrollable electronic counter means is coupled to the keyboard for arithmetically counting the pulse output to thereby define the arithmetic mode of the device. The counter means can be controlled so as to selectively effect counting of the electrical pulse output of the keyboard in a different integer base, such as in a base 9 numerical mode. Answers obtained from arithmetic operations in a base 10 system can thereby be checked by the novel calculating device utilizing the so-called "casting of 9's" principle.

3,787,673
PIPELINED HIGH SPEED ARITHMETIC UNIT

William J. Watson, and Charles M. Stephenson, both of Austin, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 743,573, July 9, 1968, abandoned. This application Apr. 28, 1972, Ser. No. 248,690
Int. Cl. G06f *7/38*
U.S. Cl. 235—156 7 Claims

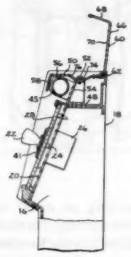


A digital computer central processing unit is disclosed having an arithmetic unit which forms an element of an instruction processing pipeline. The arithmetic unit has within it a plurality of arithmetic subunits each with its own storage and partitioned on a functional basis for the simultaneous execution of a plurality of arithmetic steps within the arithmetic unit while a plurality of instructions are simultaneously processed in their flow to the arithmetic unit. The sections of the arithmetic unit are accessible to operand input channels, the arithmetic unit further being partitioned for simultaneous single length operand execution or for double length operand execution.

3,787,674
LIGHTED CONTROL CONSOLE WITH LIFT-UP INFORMATION PLATE

Thomas J. Binzer, Louisville, Ky., and Peter H. Wooding, Providence, R.I., assignors to General Electric Company, Louisville, Ky.

Filed Nov. 1, 1972, Ser. No. 302,658
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 PA 5 Claims

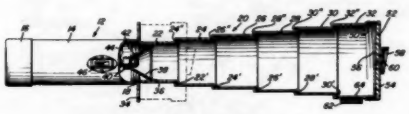


An appliance control console having a hollow housing with a front control panel. An electrical lamp is located above the control panel for illuminating the panel. A lamp shield is assembled over the lamp so that the lamp is hidden from view. A hinged cover plate is attached to the housing and it has a first horizontal position superimposed over the lamp shield and a second vertical position for display purposes. The underside of the cover plate is provided with operational information for the controls. The lamp shield includes an opening for directing light rays onto the cover plate when it is in its vertical position for ease in reading the information.

3,787,675
SIGNAL LIGHT

Wilford A. Rushing, 1120 Jefferson, Lockport, Ill., and Robert D. Sulzberger, 22311 Governor's Hwy., Richton Park, Ill.

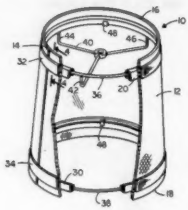
Filed June 19, 1973, Ser. No. 371,417
Int. Cl. F21l *7/00*
U.S. Cl. 240—10.6 SD 9 Claims



A base structure is provided from which there is supported a controllable light source operative to case a beam of light outwardly from the base along a predetermined path. The base includes an extendible and retractable tube assembly supported therefrom in alignment with the aforementioned path for receiving the beam of light therethrough and the tube assembly includes a plurality of relatively telescopingly engaged

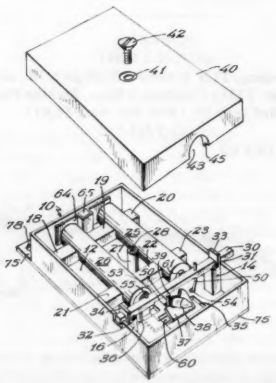
tube sections. An end cap is provided for the outer end of the tube assembly and includes a reflective inner surface for reflecting the beam of light cast thereon from the light source back toward the light source. In addition, the individual tube sections are constructed of color-tinted light transparent material. When the tube assembly is fully collapsed and the end cap is removed, a hand-supportable portable light is defined and when the tube assembly is extended and the end cap is secured over the outer end of the tube assembly an illuminated wand is provided.

3,787,676
COLLAPSIBLE LAMPSHADE
Irving S. Korach, 17135 Gunther St., Granada Hills, Calif.
Filed Oct. 30, 1972, Ser. No. 301,956
Int. Cl. F21v *1/06*
U.S. Cl. 240—108 R **12 Claims**



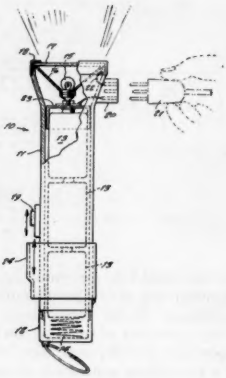
A lampshade comprising an outer covering of a flexible covering material permanently formed into a continuous, open-ended configuration having bonded to the inner surface thereof a set of preformed flexible retainers having endwise directed channels for each detachably receiving a separate wire lampshade hoop to form a collapsible and re-assemblible lampshade.

3,787,677
LOCK AND KEY LIGHT
Bernard A. Molitor, Saint Paul, Minn., assignor to Nu-Pro Corporation, St. Paul, Minn.
Filed Aug. 21, 1972, Ser. No. 282,425
Int. Cl. E05b *17/10*
U.S. Cl. 240—2.13 **3 Claims**



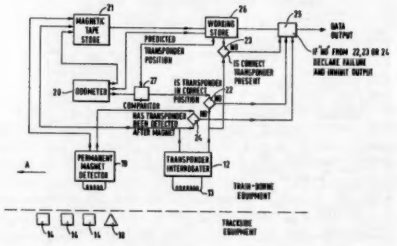
An automatic, door frame mounted, lock and key light having a button operated, battery powered light operable to illuminate the key and lock area upon opening of a screen door or the like. The button is spring loaded with the spring comprising part of the battery power circuit and moving into contact with a battery terminal upon movement of the button.

3,787,678
RECHARGEABLE BATTERY POWERED LIGHT
Robert R. Rainer, 204 Bertly, Moberly, Mo.
Filed Dec. 13, 1972, Ser. No. 314,787
Int. Cl. F21l *7/00*
U.S. Cl. 240—10.6 CH **1 Claim**



An improved flashlight that includes D.C. current dry cell batteries which can be readily replaced or which alternately can be easily recharged without need to be removed from the flashlight case; the device including a receptacle in circuit with the batteries, the receptacle being adaptable to receive a plug on an extension cord that can be connected to either a 6 or 12 volt D.C. direct current outlet such as on an automotive vehicle or portable battery charger.

3,787,679
TRAIN COMMUNICATION SYSTEM
Michael S. Birkin, and William T. Parkman, both of Derby, England, assignors to British Railways Board, London, England
Filed Jan. 26, 1972, Ser. No. 220,991
Int. Cl. B61l *3/00*
U.S. Cl. 246—30 **3 Claims**



This invention relates to a train communication system in which trackside transponder devices containing coded information as to track gradient, speed restrictions etc, pass this information to receiver equipment on the train on receipt of an

activating signal from a transmitter on the train. The system is operative to declare a fault if a transponder, at an expected location for said transponder, fails to respond to the activating signal so as to fail to pass information to the receiver equipment.

3,787,680

CAST STEEL RAILWAY CROSSING

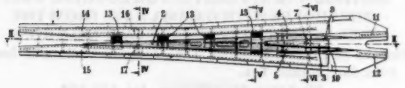
Robert Perrot, Pont-de-Briques, France, assignor to Acieries De Paris & D'Ortreau, Paris, France

Filed June 16, 1972, Ser. No. 263,700

Claims priority, application France, June 21, 1971, 7122452

Int. Cl. E01b 7/10

U.S. Cl. 246—377 6 Claims



This cast steel crossing with movable point is characterized in that the heel portion of the point is clamped on a triangular boss projecting from the crossing proper on which it can swing from one position to the other position, and that a horizontal key having a part-spherical central portion is provided for holding said heel portion of the point on said crossing boss, in order to eliminate the so-called "gap" section in the central portion of the crossing and therefore avoid the abnormal stress heretofore exerted on the wheel tires on account of the insufficient rolling surface of conventional crossings.

3,787,681

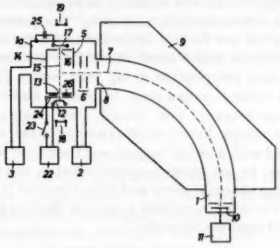
METHOD FOR ANALYSIS BY PRODUCING A MASS SPECTRUM BY MASS SEPARATION IN A MAGNETIC SECTOR FIELD OF A MASS SPECTROMETER UTILIZING IONIZATION OF A SAMPLE SUBSTANCE BY ELECTRON BOMBARDMENT

Curt Brunnee, 282 Platjenwerbe uber Vegesach, Birkenweg, and Hans-Joachim Bultemann, Walliser Strasse 94, Bremen, both of Germany

Continuation-in-part of Ser. No. 817,123, April 17, 1969, abandoned. This application Apr. 14, 1971, Ser. No. 133,823

Int. Cl. H01j 37/08

U.S. Cl. 250—41.9 SB 1 Claim



In an analysis of a sample substance by mass spectroscopy, the sample substance is bombarded in a high vacuum chamber by an electron beam to produce ionized mass particles. To minimize ion residence time in the high vacuum chamber, the bombarding electron beam is interrupted at intervals to permit the ionized mass particles to be quickly drawn out of the high vacuum chamber by a suction voltage.

3,787,682

APPARATUS FOR MEASURING THE FILLING LEVEL IN LIQUID RECEIVING CONTAINERS BY MEANS OF RADIO-ACTIVE RAYS

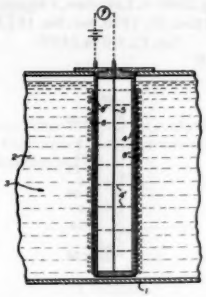
Erich Rudolf Bagge, Kiel; Joachim Trumper, Strande/Kiel, and Joachim Knaak, Erzhausen, all of Germany, assignors to Vdo Tachometer Werke Adolf Schindling GmbH, Frankfurt, Germany

Filed Apr. 29, 1970, Ser. No. 32,892

Claims priority, application Germany, Oct. 21, 1966, 1573106; Dec. 3, 1969, 1960582

Int. Cl. G01n 23/10; G01t 3/00

U.S. Cl. 250—43.5 FL 11 Claims



An apparatus for measuring the volume of hydrogen-containing liquids in containers by means of radioactive rays by feeding energy-rich neutrons from neutron sources into the liquid and the intensity of said rays of the thermal neutrons, braked in the liquid to thermal energies, being measured by means of detectors, which comprises neutron sources and detectors. The neutron sources and the detectors are combined to rod-like measuring sondes, and at least one detector is formed for thermal neutrons as a straight or curved rod. The sources are disposed at least parallel to the axis of the rod selectively continuously or in a predetermined ma ⁻r discontinuously.

3,787,683

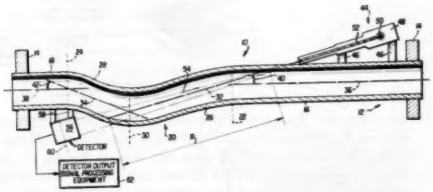
RADIATION GAUGE FOR MEASURING FLUID DENSITIES

Joseph F. Kishel, Clarks Summit, Pa., assignor to Weston Instruments, Inc., Newark, N.J.

Filed May 24, 1972, Ser. No. 256,315

Int. Cl. G01n 23/12

U.S. Cl. 250—43.5 D 9 Claims



A radiation gauge for measuring fluid densities is disclosed, which is particularly useful in monitoring the density of multiple regime fluids flowing through conduits. The gauge includes a radiation source which projects a radiation beam to a detector through a length of conduit or pipe containing a continuous stream of the fluid under investigation. The conduit or

pipe includes a relatively gentle curve in the measuring area in order to minimize the disruption of the flow of fluid within the conduit, and in order to minimize the amount of steel or conduit wall material which must be penetrated by the radiation beam. The path length traversed by the radiation beam is selected to maximize both the magnitude and the signal-to-noise ratio of the output information signal, and to maximize the resolution of the gauge.

3,787,684

BETA ACTIVATED ULTRAVIOLET RADIATION SOURCE SURROUNDED BY A VISIBLE LIGHT PRODUCING FLUORESCENT AGENT

Sampson Isenberg, 2400 N. Lakeview, Chicago, Ill.

Filed Dec. 30, 1970, Ser. No. 102,785

Int. Cl. G01n *23/00*

U.S. Cl. 250—71 R **11 Claims**

A device having utility as an ultraviolet radiation source comprising a hollow, translucent body formed of an ultraviolet radiation transmitting material. The inner walls of the body define a sealed chamber, and are provided with a thin layer, film, or coating of an ultraviolet radiation emitting phosphor. A low energy beta-electron emitting substance such as tritium is confined within the chamber and is positioned therein to enable the beta-electrons emitted by it to make direct contact with the phosphor. By embedding a fluorescent agent in the material of which the translucent body is formed, or by encapsulating the body in a material containing a fluorescent agent, the device may be utilized to transmit visible light.

3,787,685

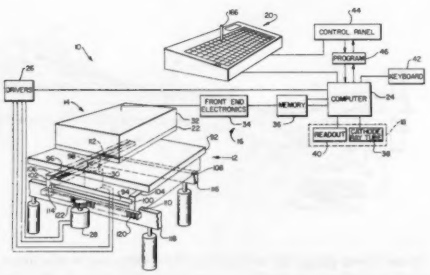
ZONE GRID ASSEMBLY PARTICULARLY FOR HIGH RESOLUTION RADIOACTIVITY DISTRIBUTION DETECTION SYSTEMS

Raymond P. Grenier, Wilmington, Mass., assignor to Baird-Atomic, Inc., Bedford, Mass.

Filed May 30, 1972, Ser. No. 258,073

Int. Cl. G01j *39/18*

U.S. Cl. 250—71.5 S **7 Claims**



A zone grid assembly for flagging specified X,Y memory locations for accumulated data analysis and for presentation on a display in connection with a radioactivity distribution detection system. The zone grid assembly includes a printed circuit board formed with a plurality of holes and a pair of arcuate conductors disposed diametrically opposite one another about the periphery of each hole. A plurality of electrically conducting and magnetically responsive balls are slidably received within the zone grid assembly in such a manner that each ball is adapted for engagement and disengagement with one pair of conductors. A magnetic stylus held in spaced relationship with the zone grid assembly operates to actuate a ball in registration therewith into engagement with its associated pair of conductors. In consequence, the engaged pair of conductors are electrically connected and a signal denoting a particular X,Y position in the zone grid assembly is applied to the memory for processing, each X,Y grid position corresponding to an X,Y address location in the memory.

3,787,686

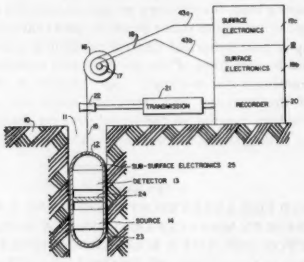
METHOD AND APPARATUS FOR LOGGING WELL BOREHOLES WITH GAMMA RAYS FROM THE INELASTIC SCATTERING OF FAST NEUTRONS

Richard B. Culver, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 24, 1971, Ser. No. 146,332

Int. Cl. G01v *5/00*

U.S. Cl. 250—83.3 R **32 Claims**



A fast neutron source is periodically switched between a pulsed mode and a continuous mode. A first gamma ray detection interval follows the pulsed mode to provide an indication of the capture gamma rays. A second detection interval occurs during the continuous mode to provide an indication of the capture gamma rays plus the gamma rays resulting from the inelastic scattering of fast neutrons. The first indication is subtracted from the second, resulting in an indication solely of the gamma rays from inelastic scattering. The pulses occurring in such intervals are further subjected to energy discrimination which provides information relating to carbon and oxygen content, such information being used with a ratio circuit to provide a carbon/oxygen ratio. In another embodiment, a pair of neutron sources, one pulsed, one continuous, provide analogous results. In still another embodiment, the borehole is first logged with a pulsed source and then later with a continuous source. In yet another embodiment, a shielding, rotating disk having alternate short and long windows is used between an alpha particle source and a neutron emitter to simulate the pulsed and continuous modes.

3,787,687

ULTRAVIOLET RADIATION DOSIMETER

Terry M. Trumble, 5718 Rockingham Dr., Dayton, Ohio

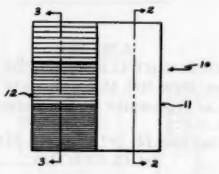
Filed Feb. 23, 1972, Ser. No. 228,644

Int. Cl. G01t *1/04*

U.S. Cl. 250—83 CD **13 Claims**

An ultraviolet radiation dosimeter is provided that comprises a transparent or white film containing a 1,3,3-

trimethylindolinobenzopyrylospiran and adjacent to the film a color chart having at least two shades of the color to which the



substituted spiropyran changes upon exposure to ultraviolet radiation.

3,787,688

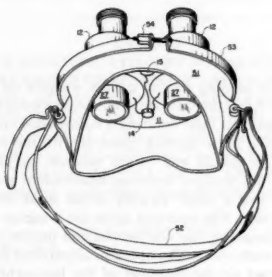
LOW LIGHT LEVEL, UNDERWATER, VIEWING DEVICE

Robert L. Stone, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 12, 1972, Ser. No. 262,165

Int. Cl. H01j *39/12*

U.S. Cl. 250—213 VT **6 Claims**



An underwater viewing system is described which provides enhanced viewing by means of an image intensification tube. The unit is binocular and permits wide angle direct viewing as well as the more narrow intensified field of view best suited for submerged operation at night or in a low light environment.

3,787,689

EXPOSURE SCANNER AND REPLENISHER CONTROL

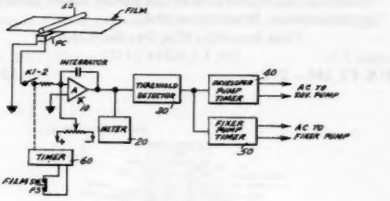
David Fidelman, Roslyn Heights, N.Y., assignor to Henry Hope X-Ray Products, Inc., Huntington Valley, Pa.

Filed May 16, 1972, Ser. No. 253,789

Int. Cl. G01n *21/30*

U.S. Cl. 250—219 FR **13 Claims**

Apparatus for automatically replenishing developer and fixer solution in an automatic photographic film processor in response to accumulated exposure density of processed film. The exposure of the continuously moving film is electronically scanned at the dryer exit. The scanner, whose timing cycle is responsive to the film speed, controls the transmission of exposure signals from the scanner photocell to an integrator. The exposure density accumulated by the integrator is applied to a threshold detector which controls a developer-replenisher-pump timer and a fixer-replenisher-pump timer. Developer and fixer replenisher bypasses are provided as well as a double replenisher option.



3,787,690

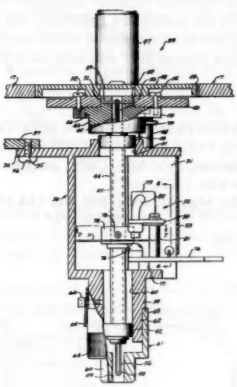
TENSION TRANSDUCER

Joseph J. Neff, Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 17, 1971, Ser. No. 209,173

Int. Cl. G01d *5/34*; **B65h** *25/22*; **G65h** *25/10*

U.S. Cl. 250—231 R **1 Claim**

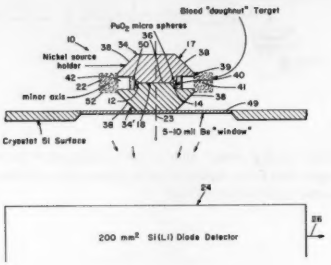


A strip tension transducer includes a pair of strip guide rollers around which strip material, in which tension is to be measured, is passed so that the strip path is through the axis of rotation of a guide roller carrier which has its axis parallel to and midway between the axes of the guide rollers. Resilient bias means are coupled to the carrier for biasing it to rotate toward a limit of its rotation against strip tension forces applied to the guide rollers. The bias means are disposed coaxially of the carrier and are adjustable for varying the bias force applied to the carrier. An electro-optical signal generator is coupled to the carrier for generating a signal indicative of the angular position of the carrier.

3,787,691
SOURCE HOLDER COLLIMATOR FOR ENCAPSULATING RADIOACTIVE MATERIAL AND COLLIMATING THE EMANATIONS FROM THE MATERIAL

Gerard R. Laurer, Monroe, N.Y., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Jan. 31, 1973, Ser. No. 328,154
Int. Cl. G01r *23/22*
U.S. Cl. 250—272 **10 Claims**

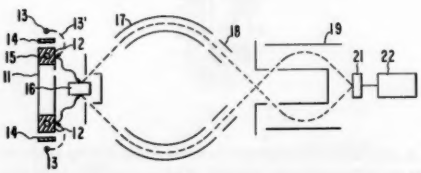


This invention provides a transportable device capable of detecting normal levels of a trace element, such as lead in a doughnut-shaped blood sample by X-ray fluorescense with a minimum of sample preparation in a relatively short analyzing time. In one embodiment, the blood is molded into a doughnut-shaped sample around an annular array of low energy radioactive material that is at the center of the doughnut-shaped sample but encapsulated in a collimator, the latter shielding a detector that is close to the sample and facing the same so that the detector receives secondary emissions from the sample while the collimator collimates the primary emissions from the radioactive material to direct these emissions toward the sample around 360° and away from the detector.

3,787,692
INDUCED ELECTRON EMISSION SPECTROMETER USING PLURAL RADIATION SOURCES

Weston A. Anderson, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed May 17, 1971, Ser. No. 144,106
Int. Cl. H01j *37/26*
U.S. Cl. 250—305 **11 Claims**

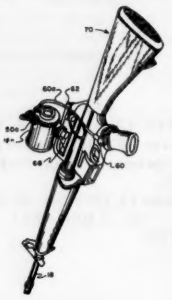


An induced electron emission spectrometer wherein different sources are employed to irradiate the sample from different energy sources to permit the operator to distinguish the photoelectron emission lines from the Auger electron emission lines. In one embodiment, the X-ray source employs two different X-ray energy emitting materials with means for selectively energizing one or the other of said materials to irradiate the sample under investigation with selective X-ray energies. In another embodiment the sample is first irradiated with X-rays and thereafter irradiated with electrons. In another embodiment, an X-ray source and then an ultraviolet radiation source are used.

3,787,693
BORESIGHT ALIGNMENT DEVICE

Robert L. Stone, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 14, 1972, Ser. No. 315,064
Int. Cl. G01t *1/16*
U.S. Cl. 250—330 **5 Claims**



A means for zeroing a small caliber weapon on a target at night without firing the weapon. The means comprises using a boresight alignment light emitting a continuous infrared light that is mounted on a tapered mandrel with the mandrel inserted into the muzzle end of the weapon, an aiming light mounted on the weapon emitting intermittent pulses of infrared light, and a night viewing scope head worn by the weapon operator. The operator zeros the weapon on the target by superimposing the continuous and intermittent pulses of light onto each other. The operator aligns both lights by adjustment screws on the housings of the boresight alignment light and the aiming light.

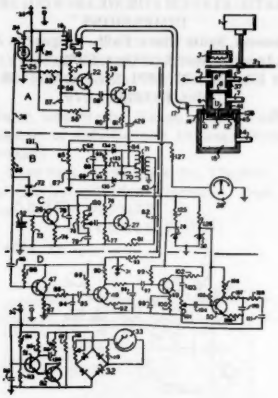
3,787,694
FLUIDIC DETECTOR FOR THE DETECTION OF RADIANT ENERGY AND FOR THE ANALYSIS OF GAS MIXTURES

Kenneth Owen, 6201 Hibbling Ave., Springfield, Va.

Continuation-in-part of Ser. No. 38,005, May 18, 1970, abandoned. This application July 11, 1972, Ser. No. 270,748
Int. Cl. G01n *21/26*
U.S. Cl. 250—338 **23 Claims**

A radiation detector and gas analyzer of the kind wherein radiant energy is directed along one or more beam-paths into a corresponding number of detector cells containing substances selectively responsive to the radiant energy. Gas is free to flow from one compartment of the detector cell to the other and this flow is used to actuate a sensing element which consists of a variable inductance or capacitance actuated by a vane placed in the path of the gas flow between compartments of the detector cell. The sensing element is made a part of the frequency determining network of an electronic oscillator, and this oscillator is connected with a reference oscillator in

phase-lock loop so that when the sensing element moves and causes detuning of the detector oscillator, servo corrective



voltages are produced in the phase lock circuit which are proportional to the movement of the sensing element and thus an electrical output is produced which is measured or recorded.

3,787,695

SAMPLE IDENTIFICATION BY MEASUREMENT OF WAVELENGTH OF LUMINESCENCE UTILIZING PLASMA DISCHARGE LAMP EXCITATION AND CONTINUOUS INTERFERENCE FILTER

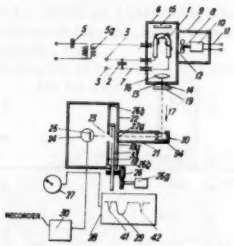
Michael Anthony West, Orpington, England, assignor to The Royal Institution of Great Britain, London, England

Filed Sept. 15, 1971, Ser. No. 180,628

Claims priority, application Great Britain, Sept. 17, 1970, 44524/70

Int. Cl. G01n *23/00*

U.S. Cl. 250—365 **10 Claims**



In an apparatus for detecting the intensity of luminescence at various wavelengths emitted by a sample under test, the sample is excited by light from a plasma discharge flash lamp coupled to an electrical supply circuit including means for storing electrical energy and repeatedly discharging rapidly the stored energy to produce flashes of high peak intensity over a continuous range of wavelengths in the exciting wavelength region. A continuous interference filter is movable across the path of luminescence from the sample to a detector for analysing the wavelength of luminescence emittal.

3,787,696

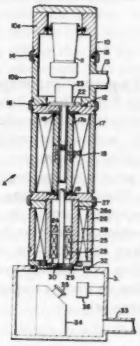
SCANNING ELECTRON MICROSCOPE ELECTRON-OPTICAL COLUMN CONSTRUCTION

James Dao, Alameda, and Nelson C. Yew, Los Altos, both of Calif., assignors to ETEC Corporation, Hayward, Calif.

Continuation-in-part of Ser. No. 75,899, Sept. 28, 1970, abandoned. This application Mar. 15, 1972, Ser. No. 234,977

Int. Cl. H01j *37/26*; **G01n** *23/00*

U.S. Cl. 250—311 **15 Claims**



A scanning electron microscope in which the electron-optical column is formed by a plurality of magnetic coils disposed around a removable tube, an electron beam being directed axially through the tube. The tube is suitably sealed at respective ends to the electron gun and specimen-containing portions of the electron-optical column, and thus functions to contain the vacuum thereon. Preferably, the tube comprises a thin, non-magnetic stainless steel tube having a wall thickness of less than 10 mils, to prevent electrostatic charging while minimizing eddy current losses. Alternatively, the tube may comprise a thin metallic layer or inner tube within an insulating, reinforcing outer tube, to impart strength and rigidity to the tube structure.

3,787,697

NEUTRON AND GAMMA FLUX DETECTOR

Ross Bisbee Shields, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed Oct. 8, 1971, Ser. No. 187,769

Claims priority, application Canada, Jan. 19, 1971, 103078

Int. Cl. G01t *3/00*

U.S. Cl. 250—390 **1 Claim**

A neutron and gamma flux detector having a prompt response in providing an electrical current when disposed in neutron and gamma flux is provided, comprising a central emitter of platinum, cerium, osmiun or tantalum, compressed magnesium oxide electrical insulation around the emitter, and an Inconel outer tubular collector enclosing the emitter and spaced from it by the electrical insulation.

3,787,698

RECORDING OF FAST NEUTRON IMAGES

John J. Antal, Framingham, and Robert L. Becker, Ashland, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 11, 1972, Ser. No. 296,685
Int. Cl. G03b 41/16
U.S. Cl. 250—473 4 Claims

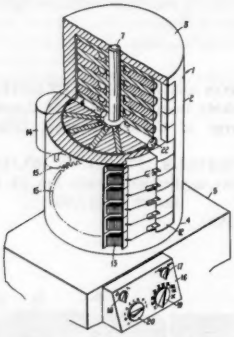
The formation of a permanent image of a fast neutron beam on cellulose nitrate film. The cellulose nitrate film is positioned between a converter film made of a suitable hydrogen-containing material, such as polyethylene, and the assembly attached to a back plate of aluminum. The neutron exposure is made with the neutrons impinging on the uncovered polyethylene face. Elastic scattering of fast neutrons by the nuclei of the hydrogen atoms in the polyethylene film produces protons which travel into the cellulose nitrate, leaving sensitized spikes therein. The cellulose nitrate film is etched by suspending in a sodium hydroxide solution and the image on the dry film viewed by transmitted light with the light source off the viewing axis.

3,787,699

ROTARY DRUM FOR STORING RADIO-ACTIVE OBJECTS

Surkes Menachem, Rishon-Lezion; Ivan Kis, Tel-Aviv, and Rosental Nathan, Givataim, all of Israel, assignors to The State of Israel, Atomic Energy Commission, Tel-Aviv, Israel

Filed June 24, 1971, Ser. No. 156,262
Claims priority, application Israel, Aug. 19, 1970, 35130
Int. Cl. G21h 5/00
U.S. Cl. 250—507 3 Claims



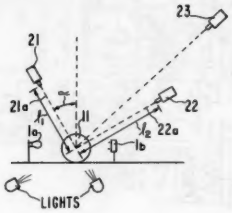
Apparatus for the storage of radio-active objects, such as, for example, radio-active needles or the like, comprising a cylindrical drum mounted for rotation about its axis within a cylindrical casing, a first plurality (m) of axially spaced tiers of radially directed cavities formed in said drum so as to join a second plurality (n) of radially spaced apart columns of cavities, an elongated opening formed in the casing, means for rotatably displacing the drum so as successively to bring successive cavity columns opposite said opening and a first plurality (m) of individual closure means associated with said opening and respectively adapted to close the cavities otherwise exposed by the opening.

3,787,700

AUTOMATIC SYSTEM FOR MEASURING SELECTED DIMENSIONS

Leon H. Chasson, Santa Clara, Calif., assignor to Atmospheric Sciences, Incorporated, Los Altos, Calif.

Filed July 27, 1971, Ser. No. 166,418
Int. Cl. G07b 11/10
U.S. Cl. 250—560 21 Claims



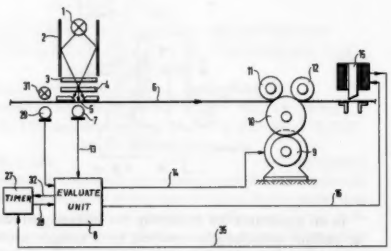
A plurality of discrete marker sensors and a multiplicity of linear arrays are used to measure selected dimensions of passing objects. One linear array is used in conjunction with selected marker sensors to measure the lengths of objects and the remaining marker sensors and linear arrays are used to measure selected dimensions of objects perpendicular to their lengths. The system is particularly useful in measuring the lengths and selected diameters of logs.

3,787,701

METHOD OF AND APPARATUS FOR DETECTING THE IMAGE FIELDS CONTAINED ON A STRIP OF FILM

Kurt Thaddey, Buchs/ZH, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed July 8, 1971, Ser. No. 160,609
Claims priority, application Switzerland, July 9, 1970, 10380/70; June 18, 1970, 7827/70
Int. Cl. B26d 5/34
U.S. Cl. 250—561 22 Claims



A film strip is moved lengthwise from a position at which the light transmission of the strip is measured to a punching station at which a predetermined type of mark or notch is formed in the film. The light transmission is measured by passing a beam of light through the film onto a number of photocells coupled to electronic circuits which binary code

the signals from the cells. Those signals which exceed a predetermined first threshold value are allocated one binary signal and the simultaneous occurrence of such binary signals is taken to indicate the beginning or end of an image frame on the strip, the indication being subsequently utilised to activate the punching station.

3,787,702

APPARATUS FOR DETECTING AND EVALUATING INDICIA ON PROCESSED PHOTOGRAPHIC FILM OR THE LIKE

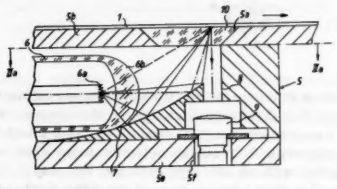
Friedrich Hujer, and Walter Knapp, both of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 1, 1971, Ser. No. 176,924

Claims priority, application Germany, Sept. 5, 1970, 2044116; Sept. 5, 1970, 7033182

Int. Cl. G01n *21/30*

U.S. Cl. 250—561 **21 Claims**



Graphite marks at one side of a travelling web of processed photographic film are tracked by a battery of photosensitive detectors each of which scans a discrete strip-shaped section of the web. The output signals from the light-sensitive elements of the detectors are transmitted to an OR-gate which controls an operational amplifier serving to arrest the web in response to detection of a mark by at least one detector. The width of the strip-shaped sections which are scanned by the detectors is a small fraction of the width of a graphite mark. The operational amplifier does not arrest the web when the detectors detect indicia other than the graphite marks which are applied to the web in order to insure stoppage of the web whenever a frame line between two film frames moves into register with a severing device.

3,787,703

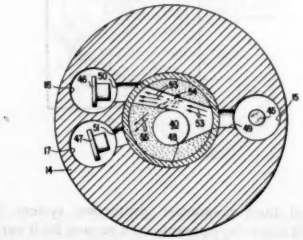
OPTICAL SENSING SAMPLING HEAD

George J. Topol, Silver Spring, Md., assignor to Biospherics Incorporated, Rockville, Md.

Filed May 25, 1972, Ser. No. 256,821

Int. Cl. G01n *21/26*

U.S. Cl. 250—574 **9 Claims**



An optical sensing head which can be used with a probe and immersed in fluids and which operates to detect direct and refracted light transmission characteristics of the fluid and provide electrical signals representative thereof for further analysis. The apparatus includes a glass tube surrounded by an opaque cylindrical body having compartments to hold a light source and two photocells. The source and photocells lie in the same plane which is transverse with respect to the tube axis. An occluding pin is non-centrally disposed within the tube and is spaced from the interior walls of the tube. The body which holds the photocells and light source has openings which permit light from the source to illuminate the interior of the tube and which permits the photocells to sense light coming from within the tube, substantially all ambient light being excluded by the opaque body. The angular relationship of the openings to the photocells and source is critical, the path between one photocell and the light source being in a direct line with the occluding pin so that no light can pass directly from the source to that photocell. The other photocell, however, is disposed so that there is a direct linear light path between the source and that photocell. Thus, one cell receives direct light transmission and the other cell receives light only as a result of reflection and refraction by a fluid placed in the space in the plane containing the photocells. The apparatus includes a piston which surrounds the occluding pin within the tube and which is mounted for reciprocating movement therein to alternately block and unblock the light paths, draw fluid samples into the tube and then expel the samples, and to wipe the interior of the tube and the exterior of the occluding pin clean with sealing rings carried by the piston on each reciprocating motion. In a preferred embodiment the head is mounted on an elongated cylindrical housing so that it can be immersed to any desired depth in a body of fluid and can be cyclically driven to monitor the light transmission characteristics of the fluid while immersed.

ERRATA

For Classes 307—41 thru 315—169 TV see:
Patents Nos. 3,787,728 thru 3,787,753

3,787,704

ELECTRONIC FLASH UNIT WITH CONTROLLED LIGHT ENERGY

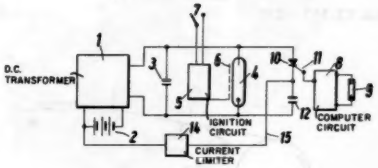
Rolf Dieter Dennewitz, and Walter Schmidt, both of Berlin, Germany, assignors to Loewe-Opta GmbH, Kronach, Germany

Filed Feb. 16, 1971, Ser. No. 115,383

Claims priority, application Germany, Feb. 20, 1970, 2008801

Int. Cl. H05b *37/00, 41/32*

U.S. Cl. 315—241 P **1 Claim**



In an electronic flash unit circuit arrangement there is provided an electronic flash tube with a shunt circuit lying in parallel to said tube and becoming conductive in dependence on the quantity of light reflected from the subject to be photographed and then short-circuiting said flash tube. This shunt circuit comprises a series connection of an electronic switch element controllable by a control circuit operated by said reflected light quantity and of one or several auxiliary capacitors which take up the excess energy from the storage capacitor whose charge energizes said flash tube. This storage capacitor may be short-circuited by means of a switch or it

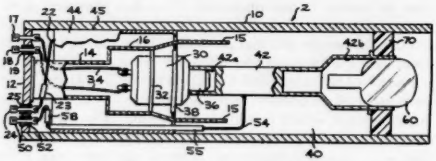
may be used for improving the energy balance of the entire flash circuit arrangement.

3,787,705

MICROWAVE-EXCITED LIGHT EMITTING DEVICE

Larry R. Bolin, Owensboro, Ky., and Shelby A. Jolly, Rockport, Ind., assignors to General Electric Company, Owensboro, Ky.

Filed Apr. 28, 1972, Ser. No. 248,477
Int. Cl. H05b 41/24
U.S. Cl. 315—248 4 Claims



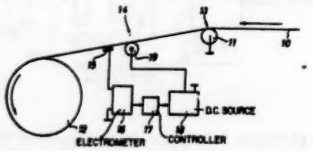
A microwave-excited light emitting device is provided comprising an electrodeless evacuated discharge lamp containing ionizable elements mounted in the frequency determining resonator of a microwave oscillator. The oscillator resonator is tuned to provide a microwave energy at a frequency sufficiently high to provide ionization and excitation of the elements within the electrodeless discharge lamp while mitigating deleterious ion bombardment of the walls of the electrodeless discharge lamp. By placing the lamp in the oscillator resonator any changes in the electrical characteristics of the lamp after firing will cause a frequency shift in the oscillator allowing the lamp and oscillator to remain in tuned relationship.

3,787,706

APPARATUS FOR THE CONTROL OF CHARGE ON A MOVING WEB

Wilfried Florent De Geest, Berchem, Belgium, assignor to Agfa-Gevaert N.V., Mortsel, Belgium

Filed May 3, 1971, Ser. No. 139,745
Claims priority, application Great Britain, May 4, 1970, 21,365/70
Int. Cl. H05f 3/00
U.S. Cl. 317—2 R 2 Claims



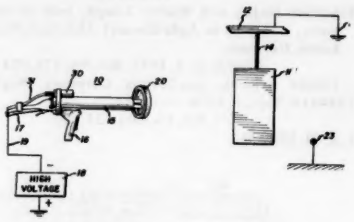
A method for controlling electrostatic charges on a web, wherein the web is pulled over a metal roller which is connected to a D.C. voltage supply, the electrostatic field of the web is measured, and the voltage supply is controlled as a function of the measured field to produce a voltage of a polarity whereby the electrostatic field produced by the web is greatly neutralized.

3,787,707

SPARK DETECTOR APPARATUS AND METHOD

Paul S. Gregg, Indianapolis, Ind., assignor to Ransburg Electro-Coacting Corp., Indianapolis, Ind.

Continuation of Ser. No. 77,299, Oct. 1, 1970, abandoned.
This application May 16, 1973, Ser. No. 360,896
Int. Cl. H02h 3/14
U.S. Cl. 317—9 R 7 Claims



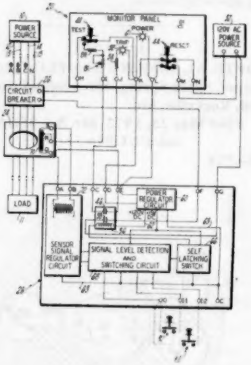
A spark detector for electrostatic coating apparatus which distinguishes disruptive discharges in the electrostatic system from a corona discharge or random sparking of other electrical equipment. A frequency selective radio wave receiver is connected with an envelope detector, the output of which is analyzed to detect the presence of repetitive discharges.

3,787,708

MONITOR SYSTEM FOR GROUND FAULT RELAY

Charles F. Hobson, Jr., Southington, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jan. 2, 1973, Ser. No. 320,537
Int. Cl. H02h 3/26
U.S. Cl. 317—18 D 6 Claims



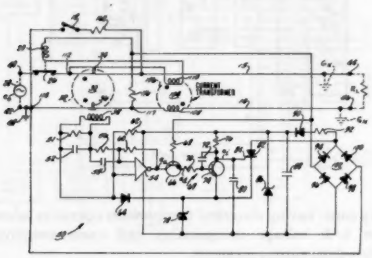
A ground fault responsive protection system having a ground fault trip relay operable by a ground fault current sensor for operating a circuit interrupter when the ground fault current reaches a pre-established trip level and a monitoring system operable for testing the operation of the ground fault trip relay with selective operation of the circuit interrupter.

3,787,709

GROUND FAULT-SENSITIVE DETECTOR AND CIRCUIT BREAKER DEVICE

Ronald J. Coe, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Filed Dec. 13, 1971, Ser. No. 207,288
Int. Cl. H02h 3/26
U.S. Cl. 317—18 D 10 Claims



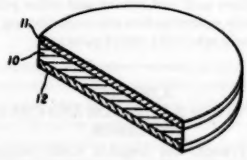
The device detects "ground faults" (short circuits to ground) in electrical wiring systems such as those used in household or factory wiring. The device causes disconnection of power if the fault current exceeds a relatively low value such as 5 milliamperes so as to minimize shock damage to the human being or other object causing the short circuit. Means are provided for detecting the grounding of the "hot" wire and/or the neutral wire at a point between the device and the load. A transformer with oppositely-wound primary windings, each connected in one of the lines, is connected in a bridge circuit in which the transformer normally is unbalanced. A ground fault adds the fourth leg to the bridge, balances the bridge, and a detector circuit causes the circuit breaker to open the line. The device also includes means for making it relatively insensitive to quadrature leakage currents; i.e., leakage currents which either lead or lag the alternating line current by 90°. This reduces the likelihood of "false tripping" of the device. A current transformer with its secondary winding in the neutral line and an independent source for energizing the primary winding helps make the device quite small in size and relatively inexpensive to manufacture.

3,787,710

INTEGRATED CIRCUIT STRUCTURE HAVING ELECTRICALLY ISOLATED CIRCUIT COMPONENTS

James A. Cunningham, 8434 Gladwood Ln., Richardson, Tex.

Division of Ser. No. 468,196, June 30, 1965. This application Jan. 25, 1972, Ser. No. 220,653
Int. Cl. H01l 19/00
U.S. Cl. 317—101 A 8 Claims



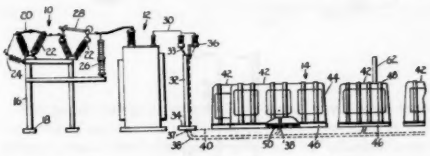
A method of fabricating an integrated circuit having interconnected circuit components adjacent one surface of a semiconductor body having its opposite surface disposed upon an insulating layer on a substrate wherein the semiconductor material between the circuit elements is removed to form a moat or channel between the circuit elements and electrically isolate them from one another by the space remaining after the removal and the insulating layer.

3,787,711

ELECTRICAL POWER SUBSTATION

William L. Bright, 605 S.W. Curry St., Portland, Oreg.

Filed Sept. 11, 1972, Ser. No. 287,752
Int. Cl. H02b 1/20
U.S. Cl. 317—103 8 Claims



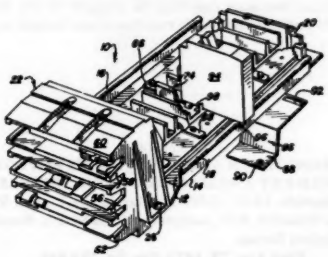
An electrical power substation including a primary side, transformer means, and a secondary side. The primary side comprises a deadend tower to which the incoming lines are attached. The secondary side has a plurality of electrically insulated enclosures mounted on base pads. The enclosures house necessary elements on the secondary side with all bus work therebetween in underground cable.

3,787,712

PLUG-ON CIRCUIT BREAKER MOUNTING DEVICE PLUGGABLE ONTO A BUS BAR STACK FOR RELATIVELY LARGE PLUG-ON CIRCUIT BREAKERS AND INCLUDING MEANS FOR MOUNTING RELATIVELY SMALL PLUG-ON CIRCUIT BREAKERS NOT PLUGGABLE DIRECTLY ONTO THE BUS BAR STACK

Raymond A. Diersing, Lexington, Ky., assignor to Square D. Company, Park Ridge, Ill.

Filed Oct. 17, 1972, Ser. No. 298,316
Int. Cl. H02b 1/04
U.S. Cl. 317—119 2 Claims

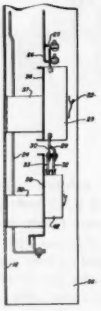


An electrical switchboard includes an enclosure and a plurality of flat bus bars arranged in a stack with flat sides parallel to a rear wall of the enclosure. Power is supplied to the bus bars through a main circuit breaker and fed to relatively large loads through relatively large circuit breakers pluggable onto the edges of the bus bars. Relatively small loads are fed through relatively small circuit breakers mountable on a mounting device which can be plugged onto the edges of the bus bars.

3,787,713
SERVICE SECTION SWITCHBOARD WITH HORIZONTALLY EXTENDING BUS BAR STACK AND MEANS FOR MOUNTING SOME CIRCUIT BREAKERS WITH LOAD TERMINALS FACING VERTICAL WIRING TROUGH AND OTHER CIRCUIT BREAKERS WITH LOAD TERMINALS FACING HORIZONTAL WIRING TROUGH

Raymond A. Diersing; Robert J. Morrill, and Harris I. Stanback, all of Lexington, Ky., assignors to Square D. Company, Park Ridge, Ill.

Filed Oct. 17, 1972, Ser. No. 298,320
Int. Cl. H02b *1/04*
U.S. Cl. 317—119 **4 Claims**



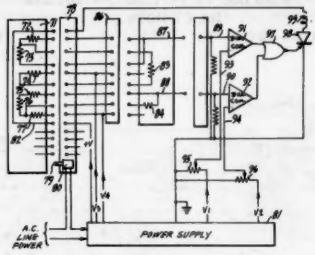
A box of the switchboard is generally of floor-to-ceiling height and contains an upper bussed current transformer compartment with provision for a watt-hour meter. A lower compartment contains a horizontally extending stack of bus bars fed by a main circuit breaker disposed adjacent one end and on the upper side of the stack. Branch circuit breakers for relatively large loads may be plugged on the bus bars from the lower side of the stack and the load wires extended therefrom toward the bottom of the box. If desired, branch circuit breakers for relatively small loads can be accommodated by distribution panels plugged on the bus bars adjacent the other end of stack from the main circuit breaker. The smaller branch circuit breakers can then be plugged on the distribution panels and the load wires run therefrom toward a side of the box.

3,787,714
ELECTRONIC LOCK AND KEY SYSTEMS EMPLOYING PAIRED KEY AND MASTER CODING MODULES

Sam L. Resnick, 15-43 200th St., Bayside, N.Y., and Stephen Berens, Peekskill, N.Y., assignors to said Sam L. Resnick, by said Stephen Berens

Filed Aug. 25, 1972, Ser. No. 283,846
Int. Cl. E05b *49/00*
U.S. Cl. 317—134 **8 Claims**

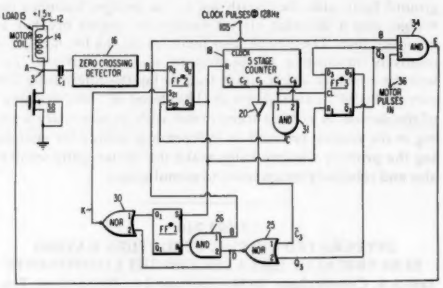
There is disclosed an electronic key and lock system for activating an electric latch when a valid key is inserted into a key receiving receptacle. The system is energized by the insertion of the key into the receiving receptacle to energize both the key and a master coding card to cause a correlation sequence to be implemented to determine whether information contained on the key is valid by comparing this information with predetermined information on the master coding card. Various embodiments utilize key cards having light accommodating apertures operative in conjunction with photodetectors, key cards having electrical components operative in conjunction with voltage comparators and cards employing frequency determining elements.



3,787,715
CONTROL CIRCUIT EMPLOYING DIGITAL TECHNIQUES FOR LOADS SUCH AS BALANCE WHEEL MOTORS

Sargent Sheffield Eaton, Jr., Warren, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1972, Ser. No. 284,907
Int. Cl. H02k *33/00*
U.S. Cl. 318—130 **9 Claims**



A circuit for supplying current pulses to a load which, for example, may be the coil of balance wheel motor, in response to selected control pulses derived from said coil and for inhibiting the supply of said current pulses in response to other pulses derived from said coil, where said other pulses include at least two closely spaced pulses and occur during the time interval between said selected control pulses.

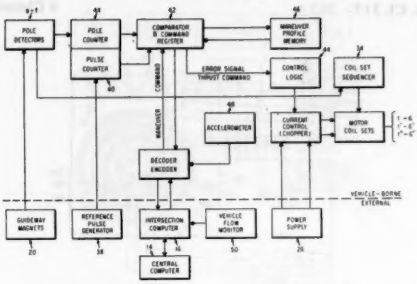
3,787,716
LINEAR PULSED D.C. MOTOR AND CONTROLS THEREFOR

Robert C. La France, Los Angeles, Calif., assignor to The Aerospace Corporation, Los Angeles, Calif.

Filed Feb. 16, 1972, Ser. No. 226,749
Int. Cl. H02k *41/02*
U.S. Cl. 318—135 **8 Claims**

A linear D. C. motor for a track guided vehicle, the motor stator consisting of a series of uniformly spaced permanent magnets mounted along the track acting in conjunction with a

vehicle attached elongated "rotor." A series of D. C. excited coils in slots across the face of the rotor react with the air gap flux between the magnets and the rotor to propel the vehicle. Automatic controls are provided to sequence excitation of the



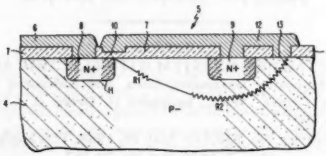
coils and control coil current to maintain precise selected vehicle velocity and position and also to respond to commands to incrementally change vehicle position with respect to another vehicle traveling at the same velocity and to effect other vehicle operations.

3,787,717

OVER VOLTAGE PROTECTION CIRCUIT LATERAL BIPOLAR TRANSISTOR WITH GATED COLLECTOR JUNCTION

Walter Fischer, Herrenberg-Affstaett, Germany; Aldo Josef Mastai, Zuerich, Switzerland, and Edouard Yves Rocher, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1971, Ser. No. 206,361
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 R **3 Claims**



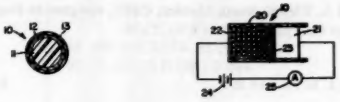
An over voltage protection circuit, especially adapted for the protection of field effect transistor gate dielectric material and other circuit structures against high voltage, high peak current, short duration impulses such as produced by static electricity. The gate of the protected FET is shunted to ground by a lateral bipolar transistor whose collector junction is passivated by a layer of silicon dioxide thinner than the passivation layer at other locations. The silicon dioxide layer is covered by a metallization layer which extends from above the collector junction and makes contact to the emitter and to the substrate. The substrate contact is connected to a source of fixed potential. The collector is connected to the gate of the protected FET.

3,787,718

SPHERICAL ELECTRONIC COMPONENTS

James A. Patterson, Santa Clara, Calif., assignor to Sondell Research & Development Co., Palo Alto, Calif.

Division of Ser. No. 731,241, May 22, 1968, abandoned. This application Aug. 8, 1972, Ser. No. 280,001
Int. Cl. H01l *5/00*; **H05b** *33/00*
U.S. Cl. 317—234 R **7 Claims**



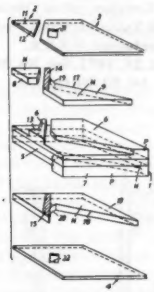
Electronic components are constructed from a solid spherical core of electrically nonconducting material such as a stabilized cross-linked copolymer plastic. The spherical core is coated with a plurality of concentric electrically functional layers to provide a variety of electronic components such as resistors and capacitors having pressure sensitive electrical characteristics. More complex electronic components such as transistors, thermistors, rectifiers and thermocouples may be provided depending upon the configuration and composition of concentric layers on the spherical core. A plurality of spheres may be combined in a pressure chamber to provide a variety of transducers and detectors such as a pressure transducer, photosensitive detector, infrared detector or memory cell bank.

3,787,719

TRIAC

Thomas Alexander Anderson, London, England, assignor to Westinghouse Brake English Electric Semi-Conductors Limited, London, England

Filed Nov. 10, 1972, Ser. No. 305,577
Int. Cl. H01l *11/10*
U.S. Cl. 317—235 R **4 Claims**



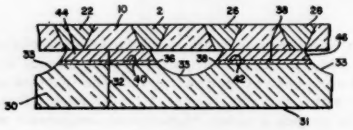
A triac element, in plan view, has a first portion of each emitter region lying one over the other and a second portion of each emitter region spaced one from the other by a distance sufficiently greater that, in operation, carriers attempting to cross the space between the second portions re-combine before succeeding in crossing. The element has metallized contacts at least one of which is in ohmic contact with one of the emitter regions, and that contact has therein an aperture of dimensions comparable to that of the spacing between the second portions of the emitter regions and, in plan view, is located in line with those portions of the emitter regions which

interconnect the first and second portions of each emitter region. There may be two such metallized contacts, one in ohmic contact with each of the emitter regions.

3,787,720
SEMICONDUCTOR VIDICON AND PROCESS FOR FABRICATING SAME

David A. Kiewit, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 28, 1973, Ser. No. 345,631
Int. Cl. H01l *15/00, 17/00*
U.S. Cl. 317—235 R **11 Claims**

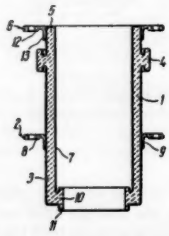


Disclosed is a semiconductor vidicon target structure and process for fabricating same wherein ohmic contact is made to active PN junction image sensing areas of the structure by means of a novel insulating interlayer through which a large plurality of highly packed metal pin connections extend. A very high packing density for these pin connections is achieved by the use of a selective anisotropic etch-out, metal backfill and lap or etch back process on a single crystal insulating wafer to obtain this thin interlayer. This interlayer eliminates the necessity for selective shielding of the vidicon semiconductor target structure with a dielectric coating or the like.

3,787,721
HIGH-VOLTAGE CAPACITOR

Vladislav Aloizovich Gedzjun, ulitsa Olminskogo, 16, kv. 50, and Petr Antipovich Yakovlev, ulitsa Vavilovykh, 15, korpus 1, kv. 21, both of Leningrad, U.S.S.R.

Filed Oct. 24, 1972, Ser. No. 300,304
Int. Cl. H01g *1/08*
U.S. Cl. 317—242 **1 Claim**

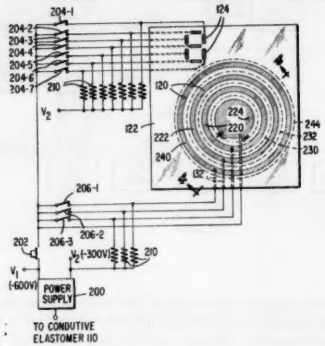


A high-voltage capacitor of high reactive power is disclosed said capacitor comprising a tube made from a dielecric material with an outward and an inward insulating projections and an external and an internal plates connected to leads on the outer surface of said tube the leads being in the form of flanges with contact plates.

3,787,722
PRINTING APPARATUS

William Alden Hatsell, Wayland, Mass., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 204,891, Dec. 6, 1971, abandoned. This application Nov. 16, 1972, Ser. No. 307,016
Int. Cl. G03g *15/00*; G01d *15/06*
U.S. Cl. 317—262 A **8 Claims**



Adjacent pattern-shaped electrographic electrodes are in motion in a plane parallel to the recording medium during the time they apply a charge to the medium. With the motion in a suitable pattern, such as an orbital pattern, the charge pattern laid down by an electrode may be spaced from that of an adjacent electrode less than the distance between these electrodes. Operating in this way makes it possible to have two adjacent electrodes spaced a sufficient distance from one another to avoid voltage breakdown between these electrodes, when one electrode is on and the other off, but still permits the respective charged patterns produced by these electrodes, when they are both on, to be closer than this distance to one another or even to overlap.

ERRATA

For Classes 318—130 and 318—135 see: Patents Nos. 3,787,715 and 3,787,716

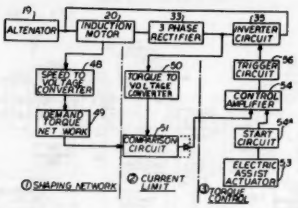
3,787,723
VEHICULAR DRIVE SYSTEM WITH ELECTRIC ASSIST

Lee T. Magnuson, Davenport, Iowa, and Alexander Kusko, Newton Centre, Mass., assignors to Deere & Company, Moline, Ill.

Division of Ser. No. 730,541, May 20, 1968. This application Mar. 2, 1970, Ser. No. 20,262
Int. Cl. H02p *5/28*
U.S. Cl. 318—230 **10 Claims**

A vehicle is equipped with a main drive system and an electric assist drive system which is actuated by the operator when the vehicle speed falls below some predetermined speed. A prime mover for the vehicle, in addition to driving two wheels directly through a primary transmission, drives a three-phase electrical alternator. The alternator energizes an induction motor with a torque-regulating control system for independently driving two other wheels of the vehicle to provide greater traction at low speeds. The rotor circuit of the induction motor includes a rectifier bridge which feeds a line-commutated inverter for coupling the slip power back to the stator input. The control system determines the firing angle for conduction of the switches in the inverter to control the output torque of the induction motor as a function of speed. The system includes a shaping network which defines the desired

speed-torque characteristic for accelerating the vehicle; and it generates a signal representative of a demand torque for a given motor speed. Another circuit sensing rotor current generates a signal representative of the load torque. A comparison circuit receives the two signals representative respectively of the actual torque and the desired torque for that



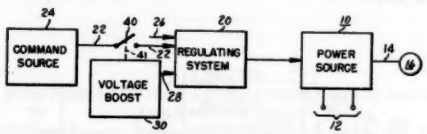
speed; and it generates an error signal for controlling the firing angle of the switches in the inverter circuit such that the motor and vehicle are accelerated along the torque-speed envelope of the shaping network once the assisting system is actuated. Thus, the control system regulates the output torque of the assisting induction motor as a predetermined function of vehicle speed.

3,787,724

VOLTAGE CONTROL OF AN A.C. DRIVE SYSTEM DURING MOTOR STARTING

Niels P. Pedersen, Waterford, and Henry L. Schultz, Jr., Erie, both of Pa., assignors to General Electric Company, Salem, Va.

Filed Apr. 17, 1973, Ser. No. 351,824
Int. Cl. H02p *1/04*
U.S. Cl. 318—410 **15 Claims**



Method and apparatus for providing adequate breakaway torque for the a-c motors being started in a system in which a source of adjustable voltage a-c electric power such as an inverter supplies electric power to the motors being started. The output voltage of the source is substantially increased in a non-abrupt manner for an initial predetermined starting period to provide adequate break-away torque, the voltage thereafter being reduced to a level corresponding to a predetermined desired constant ratio relative to output frequency.

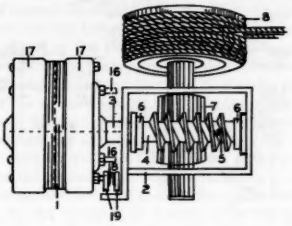
3,787,725

ELECTRIC GARAGE DOOR OPENER

Lucien Lafontaine, 637 Place Fleury, Montreal, Quebec, Canada

Filed Jan. 29, 1973, Ser. No. 327,642
Int. Cl. H02k *13/00*
U.S. Cl. 318—491 **2 Claims**

A mechanism for operating a door including a reversible electric motor composed of a rotatable armature and a rotatable rotor connected therewith to a rotatable shaft having a rotatable speed, a worm locked on said shaft in working engagement with said shaft, a worm gear in working engagement with said worm having a given rotational speed proportioned to the rotational speed of the worm, door closure actuating means operatively connected with the worm gear, limit switch means electrically connected to the motor and disposed in a



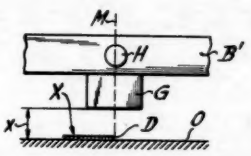
region adjacent to one of the screw holding end covers of the motor together said screw contacting the limit switch means when the rotational speed of said worm gear varies from the rotational speed of said rotor causing said armature and its screws to rotate in the opposite direction.

3,787,726

CONDUCTIVE LINE FOLLOWING DEVICE FOR STEERING A VEHICLE

Wolfgang Krapp, Im Eicken, Marienheide-Kalsbach, Germany

Filed Oct. 22, 1971, Ser. No. 191,650
Claims priority, application Germany, Oct. 23, 1970, P 20 52 102.2
Int. Cl. G05d *1/00*; B64c *13/18*
U.S. Cl. 318—587 **12 Claims**



An electronic regulating arrangement in which an analog signal generator is either inductively or capacitatively coupled with an electrically conductive element having an edge displaceable with respect to a centerline of the active operating zone of the signal generator. When the edge is displaced with respect to the centerline of the active zone, when the edge is projected in the plane of the active zone, the generator emits a voltage proportional to the projected displacement of the edge relative to the centerline. The voltage increases positively or negatively in proportion to the displacement of the edge from the centerline, and dependent upon the direction of the displacement. A zero output voltage is obtained when the edge coincides, when projected, onto the centerline of the generator's active zone.

3,787,727

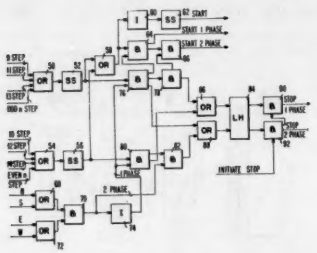
STEPPER MOTOR CONTROL

Ray A. McSparran, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1972, Ser. No. 319,100
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **5 Claims**

A half-step stepper motor control circuit in which the acceleration period is constant independent of whether the ad-

vance instruction occurs, (1) when the motor starts from 1 phase energization, or (2) when the motor starts from 2 phase



energization, and the deceleration period is constant and independent of whether (1) the motor stops in 1 phase energization or (2) the motor stops in 2 phase energization.

3,787,728

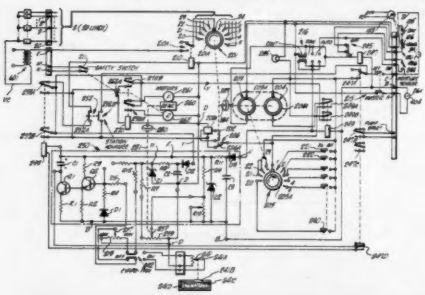
IRRIGATION AND SPRINKLER SYSTEM

Donald R. Bayer, Claremont; Lewis M. Ritchie, Los Angeles, and Jon A. Rivens, Upland, all of Calif., assignors to Clemar Manufacturing Corporation, Azusa, Calif.

Filed Dec. 30, 1971, Ser. No. 214,259

Int. Cl. H02j 3/14

U.S. Cl. 307—41 **21 Claims**



A watering system incorporates two selectable watering programs in one of which (Irrigation Mode) watering at each one of automatically sequentially selected stations occurs for a long time (each adjusted in the range of 1 hour to 24 hours) and in the other one of which (Environmental Mode) watering at each one of automatically sequentially selected stations occurs for a short time (each adjusted in the range of 1 minute to 30 minutes). The stations selected for watering in the irrigation mode may be different from those selected in the environmental mode. Automatic changeover from the irrigation to the environmental mode occurs in accordance with wind, heat or frost; for wind protection, crop cooling and frost protection and when the environmental program is completed the system automatically reverts back to the irrigation mode (except when the frost switch is operated, in which case a manual reset operation is required) which has memory in that the irrigation unit resumes watering under the same conditions which existed at the time of transition from the irrigation to the environmental mode. In case of rain, both systems are rendered inoperative and require manual resetting. The irrigation mode incorporates means whereby compensation may be effected in accordance with evaporation conditions.

3,787,729

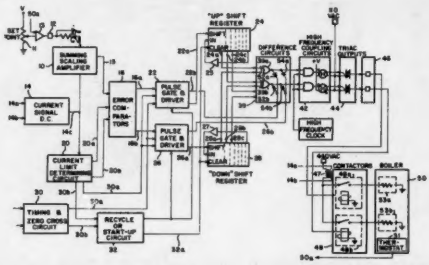
SEQUENCING STEP CONTROL

Charles D. Bennett, Alderwood Manor, Wash., assignor to Cam Industries, Inc., Kent, Wash.

Filed July 13, 1972, Ser. No. 271,622

Int. Cl. H05b 1/02

U.S. Cl. 307—41 **4 Claims**



A control for varying loads such as heating elements in response to a change in an environmental variable such as temperature in which the first load to be energized is always the first load to be de-energized and the last load to be energized is always the last load to be de-energized.

3,787,730

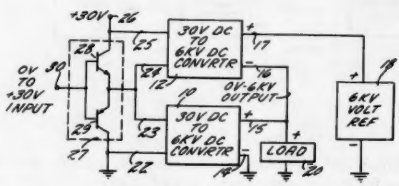
BILATERAL HIGH VOLTAGE DC SYSTEM

Thomas J. Ray, Yonkers, N.Y., and Glenn C. Waehner, Riverside, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 29, 1971, Ser. No. 213,666

Int. Cl. H02m 3/22

U.S. Cl. 307—77 **6 Claims**

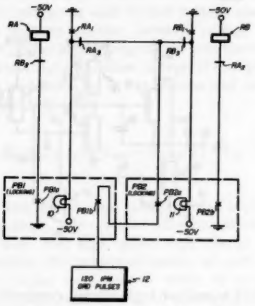


A load is connected across one DC source of a first polarity and is connected to the opposite polarity of a second DC source, the two sources being connected in series with a capacitor/resistor network, or other voltage maintaining circuit, connected in parallel with the series combination of the two sources. The first source drives the load in one polarity and the second source drives the load in the other polarity thereby to achieve rapid slewing of the voltage across the load. In another embodiment a fixed power source may be connected in series with the first power source so that the slewing of voltage across the load occurs above a given reference level. The first and second sources are driven in a complementary fashion so that the sum of their instantaneous output voltages is always constant and equal to the individual maximum voltage which each may obtain. Since the slewed sources comprise a high voltage bilateral system, feedback may be utilized for stability and accuracy.

3,787,731
ELECTRICALLY INTERLOCKING PUSHBUTTON CIRCUIT WITH ERROR INDICATION

Kurt F. Herr, Woodridge, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Apr. 6, 1973, Ser. No. 348,570
Int. Cl. H01h 47/00
U.S. Cl. 307—115 9 Claims

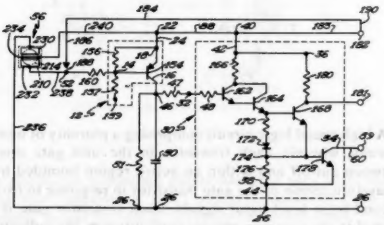


An electrically interlocking pushbutton circuit with error indication is disclosed, including two locking-type pushbuttons which are electrically interlocked such that a first operated pushbutton must be released before the second can be operated to initiate a related function. If the first pushbutton is not released, a flashing error indication is provided, by means of an indicator lamp associated with each of the pushbuttons.

3,787,732
ELECTRONIC SWITCH APPARATUS SENSITIVE TO AND ACTUATED BY TOUCH

Willis A. Larson, Wayzata, Minn., assignor to Magic Dot, Inc., Minneapolis, Minn.

Filed Dec. 18, 1972, Ser. No. 316,356
Int. Cl. H01h 35/00
U.S. Cl. 307—116 6 Claims

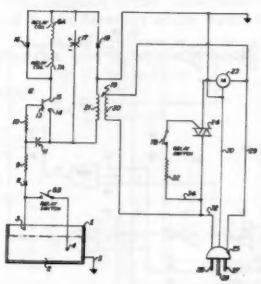


An electronic switch which has no moving parts and is actuated by the capacitance of an operator providing a connection between earth ground and an input to the electronics associated with the switch or is actuated by the skin resistance of an operator causing a lowering of D.C. resistance across the face of the switch, or both, is disclosed. The electronic switch, in the preferred embodiment shown, includes three electrodes arranged with respect to each other upon the top surface of an insulator in a laterally spaced, electrically insulated relation with the third electrode performing as a conductive electrical shielding electrode between the first and second electrodes. The first and second electrodes are exposed to the finger of an operator upon the top surface of the insulator in a manner to allow the bridging of the first and second electrodes to thus provide a direct current path to be set up laterally between the first electrode and the second electrode to thereby provide an activation of the switch through the lowering of the D.C. resistance across the face of the switch. When the operator's finger is removed, the shielding effect of the third electrode prevents any leakage currents from flowing between the first electrode and the second electrode from causing a switch activation. Further, the first and second electrodes are accessible to touch by the operator to thereby allow the operator's touch to provide an alternating voltage signal to provide an activation of the switch. Electronics which allows activation of the switch is shown in the form of a first amplifier accepting the electronic signal input provided by the operator's finger and providing a related signal to an integrator, shown in the preferred embodiment as a capacitor. A second amplifier is connected to the integrator to provide a switched output, with the switched output providing a first state for approximating an electrical short circuit and a second state for approximating an electrical open circuit.

3,787,733
LIQUID LEVEL CONTROL SYSTEM

Tony Peters, 235 E. Irving Pk. Rd., Wooddale, Ill.

Filed Jan. 5, 1973, Ser. No. 302,947
Int. Cl. H01h 29/00, 35/18
U.S. Cl. 307—118 5 Claims



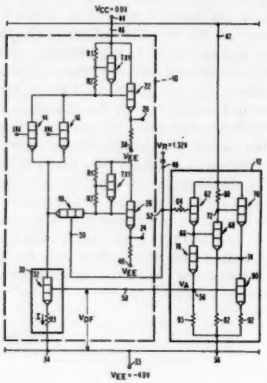
A liquid level control system for a sump pit utilizing solid state circuitry and being operable over a wide range of liquid resistances. A pair of electrodes are disposed in the sump pit at different depths. When the liquid rises to the height of the upper-most electrode, a transistor switch is triggered which energizes two relays connected in the collector circuit of the transistor. The energization of one of the relays activates a sump pump motor for emptying liquid from the sump pit and energization of the other relay connects the lower-most electrode to the circuitry so that transistor switch does not turn off until the liquid is emptied to a level beneath the lower-most electrode.

3,787,734

VOLTAGE REGULATOR AND CONSTANT CURRENT SOURCE FOR A CURRENT SWITCH LOGIC SYSTEM

Jack A. Dorler, and Donald J. Swietek, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1972, Ser. No. 257,121
Int. Cl. H03k 17/00
U.S. Cl. 307—203 4 Claims



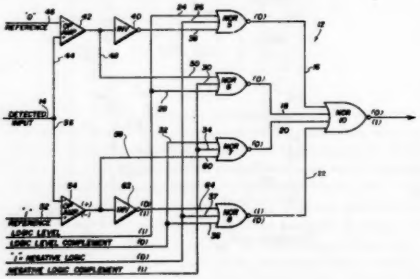
A voltage regulator circuit for energizing a constant current source for use in a current switch logic scheme.

3,787,735

LOGIC DETECTOR APPARATUS

Maurice J. DeWitte, Elmhurst, and Gerald L. Wojciechowski, Chicago, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Mar. 27, 1973, Ser. No. 345,425
Int. Cl. H03k 19/34, 19/00
U.S. Cl. 307—203 9 Claims



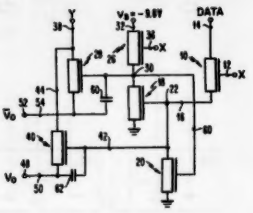
Logic detector apparatus for detecting positive and negative voltage levels with respect to "one" and "zero" reference levels in either positive or negative logic modes the apparatus including a NOR gate output stage coupled to the outputs of four selection NOR gates, respective selection NOR gates being associated respectively with detecting positive and negative voltage levels with respect to the reference levels in positive and negative logic modes, and a comparator for detecting positive and negative voltage levels, the output of the comparator being coupled to the selection NOR gates, whereby respective selected NOR gates control the output of the output NOR gate to provide respective outputs responsive to whether the logic signal detected is more or less positive than the respective "zero" or "one" reference level in either logic mode.

3,787,736

FIELD-EFFECT TRANSISTOR LOGIC CIRCUIT

William Benedict Chin, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 12, 1972, Ser. No. 261,768
Int. Cl. H03k 19/08
U.S. Cl. 307—205 2 Claims



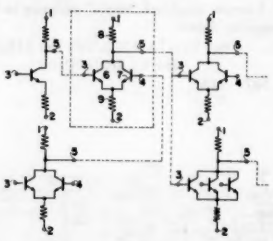
A field-effect transistor logic circuit comprising a plurality of interconnected field-effect transistor devices connected between input and output terminals. A positive feedback path connected between the output terminals and a field-effect transistor device connected to the output terminal is operative to provide an output voltage, V_O, which is greater than the supply voltage V_X applied to the output device less the threshold voltage V_{TH} of the device, i.e., $V_O \leq V_X - V_{TH}$.

3,787,737

HIGH SPEED/LOGIC CIRCUIT

Hisakazu Mukai, Tokyo, Japan, assignor to Nippon Telephone and Telephone Public Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 826,317, May 21, 1969, abandoned. This application Nov. 24, 1971, Ser. No. 201,667
Int. Cl. H03k 19/08, 19/34, 19/30
U.S. Cl. 307—215 1 Claim



A high speed logic circuit comprising a plurality of unit gate circuits, wherein each transistor in the unit gate operates between cut-off and within an active region bounded by the saturation region of the gate transistor in response to first and second logic level input signals. Each transistor gate is connected in the common emitter configuration; the collector resistance is greater than the sum of the emitter series resistance and the incremental junction emitter resistance of the gate transistor with an input signal exceeding the base-to-emitter voltage of the gate transistor. The voltage source has a voltage which is insufficient for the gate transistor to which a first logic level signal is applied to be switched to an active state from a non-conducting state. Further, the collector current of

the gate transistor is limited by the emitter series resistor when the second logic level signal is applied so that the collector junction thereof does not inject minority carriers. The potential difference between the voltage source terminals is defined by the formulas

$$V_1 - V_2 < V_{BE1} + V_L$$

$$V_L < V_{BE1} - V_{CES}$$

wherein V_1 is the voltage at said first voltage source terminal and V_2 is the voltage at said second voltage source terminal, V_{BE1} is the base to emitter forward voltage of said gate transistors, V_L is the logic swing of said gate transistors, V_{CES} is the collector-emitter saturation voltage of said gate transistors and wherein said collector series resistor and said emitter series resistor are defined by

$$1 < R_C/R_E + r_e < V_{BE1} - V_{CES}/V_1 - V_2 - V_{BE1}$$

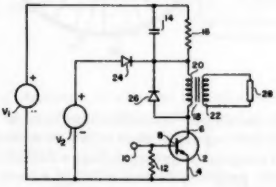
wherein R_C and R_E are said collector and emitter series resistors, respectively, and r_e is said incremental emitter junction resistance value. The high speed logic circuit is formed by directly coupling the output terminals of each of said logic gates to the input terminals of other of said logic gates whereby the signal levels at each of said input and output terminals of each of said logic gates are maintained at substantially constant binary values. The operation of the gate circuit as defined by the above equations results in a very short propagation delay time, low power dissipation, and enables the individual gate circuits to be directly coupled without the need for intervening coupling circuits to maintain the binary signal level.

3,787,738

PULSE PRODUCING CIRCUIT

Tibor G. Horwath, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 28, 1972, Ser. No. 293,190
Int. Cl. H03k 17/00
U.S. Cl. 307—237 **1 Claim**



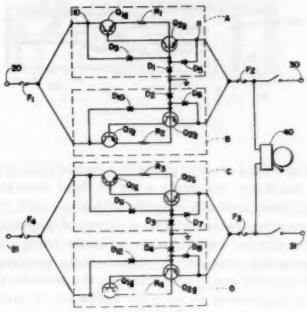
A circuit for producing pulses having a very high, steeply rising front portion of short duration, followed by a considerably longer portion of lower current is disclosed. The circuit utilizes a single transistor which is operated in the avalanche breakdown mode to provide the high, steeply rising, front portion of the output pulse and is then operated in the normal amplifier mode to provide the longer lower current rear portion of the output pulse. While the circuit has general utility as a pulse producing circuit, it is particularly useful as a thyristor firing circuit.

3,787,739

COUPLER CIRCUIT FOR TELEPHONE NETWORKS AND THE LIKE

Michael C. J. Cowpland, and Feyyaz I. Zambakoglu, both of Ottawa, Ontario, Canada, assignors to Microsystems International Limited, Montreal, Quebec, Canada

Filed Dec. 29, 1972, Ser. No. 319,334
Int. Cl. H03k 17/00
U.S. Cl. 307—255 **8 Claims**



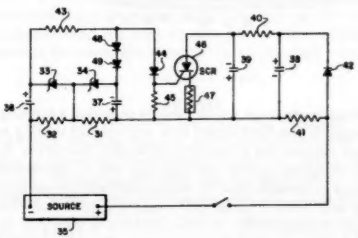
The present invention relates to a coupler circuit for insertion between a power supply circuit and a subscriber circuit connected thereto — particularly between a telephone line and a telephone set. The coupler is characterized by a thyristor-type transistor combination, the base of the second transistor of which is clamped through a breakdown device to a predetermined potential.

3,787,740

DELAY TIMER

Frank G. Salton, Annapolis, and Abraham Silverstein, Adelphi, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1972, Ser. No. 295,062
Int. Cl. H03k 17/26
U.S. Cl. 307—293 **3 Claims**



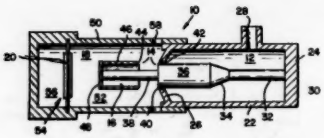
An electronic timer providing an accurate time delay comprising two oppositely charged capacitors connected in series with a resistor. One capacitor is smaller than the other and upon having the series circuit closed, it receives charge from the other capacitor. Upon passing through zero volts, an SCR is triggered setting off a squib.

3,787,741

FLUID ACTUATED ELECTRIC GENERATOR

Robert D. Gourlay, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 8, 1967, Ser. No. 646,148
Int. Cl. H01v 7/00
U.S. Cl. 310—8.8 12 Claims



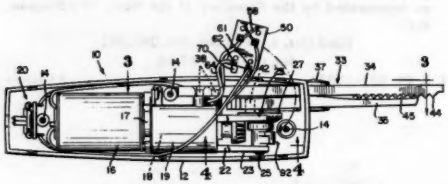
A fluid actuated electric generator embodying an edge-tone acoustic oscillator involving a jet of fluid directed upon a knife-edge from a nozzle in communication with a source of fluid under pressure to establish a source of acoustic energy, a resonant cavity for stabilizing the acoustic energy, a coupling device including a second resonant cavity proximate to the source of acoustic energy for coupling the acoustic energy to a transducer responsive to acoustic actuation to produce electrical energy, and an acoustic opaque exhaust arrangement for dissipating exhaust fluid with minimal acoustic dissipation.

3,787,742

ELECTRIC SHEARS

Timothy C. Murphy, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Mar. 7, 1972, Ser. No. 232,446
Int. Cl. H02k 7/14
U.S. Cl. 310—50 19 Claims



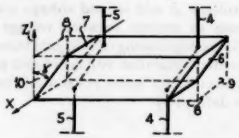
An electric shears in which there is provided a housing having swingably interconnected first and second cutting blades mounted therein and projecting outwardly therefrom. A gear train is mounted within the housing and is interconnected between a reversable electric motor and said second blade for moving said second blade with respect to said first blade. A manually manipulatable switch assembly is mounted on said housing and is coupled through a second switch assembly for actuating said motor to drive said gear train in a first direction to cause the cutting blades to open and close. A cam driven by the gear train is engageable with said second switch assembly for selectively opening and closing said assembly to control said motor to drive said gear train in a second direction for an interval sufficient to position the cutting blades in an open position and deactuate said motor.

3,787,743

FLEXION MODE CRYSTALLINE BAR FOR AN OSCILLATOR

Guy Gibert, and Pierre Vidal, both of Sartrouville, France, assignors to Compagnie d'Electronique et de Piezo Electricite C.E.P.E., Sartrouville, France

Filed Feb. 9, 1972, Ser. No. 224,704
Claims priority, application France, Feb. 26, 1971, 7106696
Int. Cl. H04r 17/00
U.S. Cl. 310—9.5 3 Claims



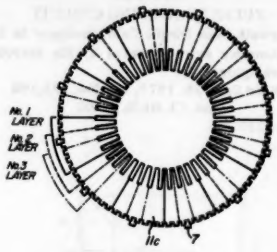
Crystalline parallelepiped bar oscillating piezoelectrically in a plane, in a flexion mode, whose terminal faces, are inclined by respect to the plane perpendicular to the longitudinal axis of symmetry of the bar, at an angle ranging between 0° and 60° measured in the flexion plane, and at an angle ranging between 0° and 45° measured in the plane perpendicular to the flexion plane.

3,787,744

LAMINATED IRON CORE OF ROTARY ELECTRIC MACHINES

Kiyoshi Saito, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed July 11, 1972, Ser. No. 270,871
Int. Cl. H02k 1/06
U.S. Cl. 310—217 7 Claims



A newly developed laminated iron core is composed of number of unit segments, each of which is shaped such that one radial marginal periphery defines a half of a coil slot and the opposite periphery defines a half of a tooth between the two coil slots.

Accordingly, when such segments are juxtaposed to form a layer of an annular iron core, a pair of the segments constitute a sector having an odd number $(2n + 1)$ of coil slots, wherein n is the number of coil slots in a unit segment, whereas a pair of unit segments of ordinary type bears an even number of coil slots.

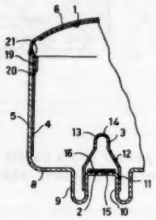
Assembled iron cores each using either one of the type mentioned above bear a different number of coil slots suitable for different frequencies such as 50 Hertz and 60 Hertz but has the same outside and inside diameter and the same number of dovetail notches, thereby permitting two kinds of iron cores to be supported within a stator frame of single unified type.

3,787,745

ELECTRON TUBE FOR ELECTRON-OPTICAL IMAGE CONVERSION

Christian J. G. H. Wulms, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 17,827, March 9, 1970, abandoned.
This application Apr. 6, 1972, Ser. No. 241,771
Claims priority, application Netherlands, Mar. 13, 1969, 6903860
Int. Cl. H01j 31/52
U.S. Cl. 313—65 R 7 Claims



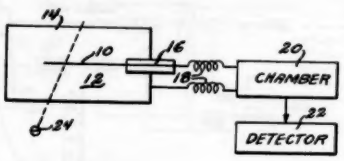
Electron-optical image converting tube comprising a photoelectric cathode and a focusing electrode applied to the tube wall, the end of the focusing electrode facing the photocathode being separated from the wall by insulating material which increases the insulation resistance between the photocathode and the focusing electrode.

3,787,746

QUENCHING GAS FOR DETECTORS OF CHARGED PARTICLES

Muzaffer Atac, Wheaton, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed May 11, 1973, Ser. No. 359,396
Int. Cl. H01j 39/26
U.S. Cl. 313—93 7 Claims



Operation of detectors of charged particles such as wire counters and Geiger-Muller tubes is improved by filling the counters with a quenching-gas mixture of argon, isobutane and methylchloroform.

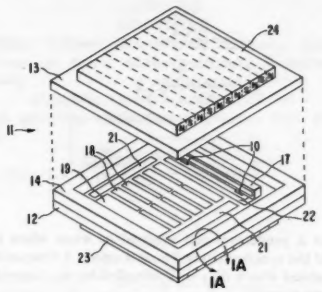
3,787,747

PERIODIC MAGNETICALLY FOCUSED BEAM TUBE

Allan W. Scott, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Aug. 7, 1972, Ser. No. 278,408
Int. Cl. H01j 25/34
U.S. Cl. 315—3.5 19 Claims

The periodic magnet structure for a periodically focused beam tube is formed by a single pair of homogeneous slabs of magnetizable material that are permanently magnetized with a pattern of magnetic poles of alternating polarity taken along the direction of the beam path. In a sheet beam tube of preferred geometry, a pair of ceramic slabs are disposed to straddle the sheet beam and the internal planar faces of the ceramic slabs have circuits printed thereon for: electrical connections to all elements, beam forming electrodes, microwave



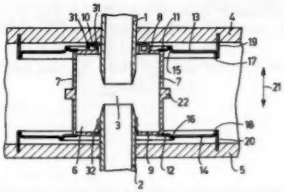
interaction structure, edge focusing electrodes, and the beam collector electrode structure. The permanently magnetized slabs are disposed external to the vacuum envelope, straddling the printed circuit ceramic slabs, for focusing the beam.

3,787,748

FREQUENCY TUNER OF A RESONATOR FOR A KLYSTRON

Klaus Liepelt, Buxtehude, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 27, 1972, Ser. No. 301,531
Claims priority, application Germany, Nov. 4, 1971, P 21 54 745.5
Int. Cl. H01j 25/10
U.S. Cl. 315—5.46 6 Claims



A non-deformable resonator surrounds high frequency interaction gap between two opposite drift members. Each drift member is secured to a fixed support. Resilient annular suspension discs are secured in vacuum tight manner between the resonator and the support member to allow position adjustment of the resonator along the axis of the drift members.

3,787,749

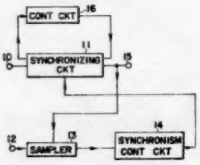
AUTOMATIC SYNCHRONIZING SYSTEM

Kozo Uchida; Naohisa Nakaya, and Koji Suzuki, all of Tokyo, Japan, assignors to Iwata Electric Company, Tokyo, Japan

Filed Aug. 20, 1969, Ser. No. 851,589
Claims priority, application Japan, Aug. 23, 1968, 43/59921
Int. Cl. H01j 29/70
U.S. Cl. 315—19 2 Claims

In an automatic synchronizing system comprising a synchronizing circuit including a variable element, a sampling device and a synchronism control circuit which operates to differentiate the output from the sampling device to vary the variable element, to stop the variation of the variable element and to maintain the stopped condition, there is provided a control circuit responsive to the cessation of operation of either one of the synchronizing circuit or the sampling device

to start either one of the synchronizing circuit, sampling device and the synchronism control circuit to continue to find a point of synchronism even in the absence of a synchronizing signal for a predetermined interval or even when the amplitude of the synchronizing signal is small. A time axis circuit may be added which may be controlled by the control circuit in the same manner.



3,787,750

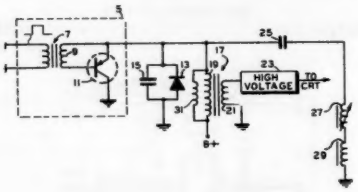
FLYING SPOT SCANNER SYSTEM HIGH VOLTAGE AND HORIZONTAL DEFLECTION CIRCUITRY

William D. Murphy, and Edward I. Zmuda, both of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed July 13, 1972, Ser. No. 271,630

Int. Cl. H01j *29/70*

U.S. Cl. 315—27 TD **7 Claims**



High voltage and horizontal deflection circuitry for a flying spot scanner system includes a first inductance associated with a flying spot scanner tube and having an inductance value in an amount sufficient to effect a desired horizontal deflection of an electron beam of the scanner tube and a second inductance which, in combination with the first inductance, provides an inductive value of an amount sufficient to cause development of a desired high voltage potential sufficient to operate the scanner tube.

3,787,751

BALLAST CIRCUITS FOR DISCHARGE LAMPS

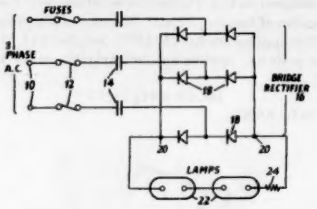
Victor Francis Farrow, London, England, assignor to Thorn Electrical Industries Limited, London, England

Filed Aug. 10, 1972, Ser. No. 279,445

Int. Cl. H05b *41/16*

U.S. Cl. 315—137 **2 Claims**

A ballast circuit for a discharge lamp is arranged to supply a uni-directional voltage to the lamp which is made up of at least two current components which differ in phase. Flicker at the supply frequency *f* and at 2*f* is thus much reduced. A preferred ballast for use with a three-phase supply employs ballast capacitors in each of the three supply lines connected to a three-phase bridge rectifier, the output of which is applied to the lamp. A preferred ballast for use with a single phase supply includes a ballast capacitor and a ballast inductor connected through respective bridge rectifiers which have some components in common.



3,787,752

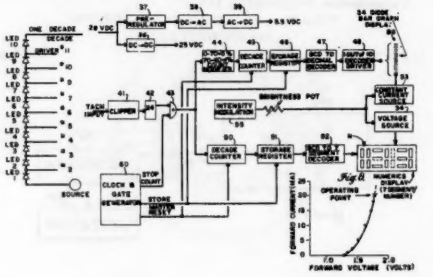
INTENSITY CONTROL FOR LIGHT-EMITTING DIODE DISPLAY

Dennis G. Delay, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 28, 1972, Ser. No. 276,017

Int. Cl. H03k *19/14*

U.S. Cl. 315—169 R **6 Claims**



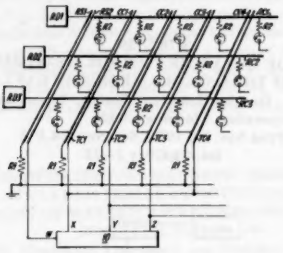
A plurality of light-emitting diode elements which are unmatched in light output at the lower portions of their forward current ranges and which form an integrated illuminated visual display are activated by a power supply arrangement which applies to each diode element a series of independent power pulses of sufficient power to activate each diode element to saturation and into light-emitting condition in a frequency range which appears to the human eye to be steady illumination, the power supply arrangement being provided with a control feature for selectively varying the duration of the power pulses in order to vary the apparent intensity of the illuminated display, and also provided with current limiting means to limit the current passed by each diode element, during each power pulse and its activation thereby, to a given upper range of forward current in which the light-emitting diode element light outputs are substantially matched and in which optimum light emission efficiency is achieved.

3,787,753

VISUAL DISPLAY DEVICES

Frank Walters, Bury, England, assignor to Ferranti Limited, Hollinwood, Lancashire, England

Filed Aug. 10, 1971, Ser. No. 170,474
Int. Cl. H05b 37/00
U.S. Cl. 315—169 TV 8 Claims



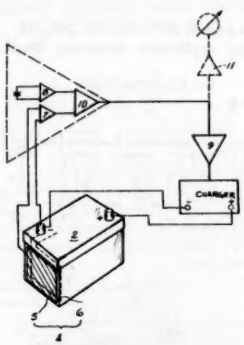
A visual display device includes a matrix of direct current gas discharge cells in a block of electrically insulating material. For each row and column of the matrix, all cells in that row or column are interconnected by a row or column conductor so that energisation of appropriate row and column conductors strikes the defined cells in the matrix. Scanning means is also provided by means of which each column conductor is energised in turn without the need for a driver for each column. Information may be written on the display device by energisation of the appropriate row conductors as each column conductor is energised, the information display remaining after the column conductor has subsequently been de-energised.

3,787,754

APPARATUS FOR CONTROLLING CHARGING OF STORAGE BATTERIES WITH SENSING THE D.C. OF THE ELECTROLYTE

Paul L. Seabase, Sterling Heights, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 16, 1972, Ser. No. 281,082
Int. Cl. H02j 7/04
U.S. Cl. 320—43 6 Claims



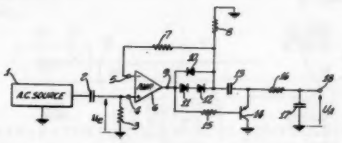
My invention relates to a device for the testing or analyzing of batteries to determine whether such is chargeable or unchargeable, and more particularly, it relates to an electronic sensing system for automatically conducting and providing a readout display which is instantly indicative of the state of a given battery with respect to its chargeability.

3,787,755

RECTIFIER

Heinz-Dieter Goldner, Schwalbach, Germany, assignor to Hartmann & Braun Aktiengesellschaft, Frankfurt/Main, Germany

Filed Feb. 14, 1973, Ser. No. 332,439
Claims priority, application Germany, Feb. 21, 1972, 2207990
Int. Cl. H02m 7/00
U.S. Cl. 321—8 R 3 Claims



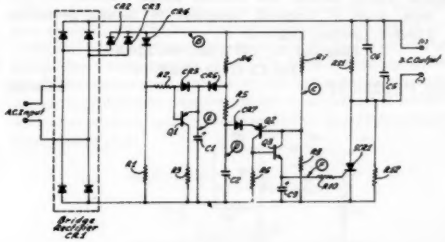
Disclosed is an electronic circuit for converting an a-c voltage into a d-c voltage. The a-c voltage is applied to a feedback amplifier incorporating a negative feedback loop having a plurality of diodes and resistances. The voltage across the diodes is used to derive a square wave signal from the amplifier, which renders a transistor switch conductive or non-conductive, depending on the polarity of the amplified signal. The amplifier output is also coupled to an RC circuit, whose capacitance is charged by alternating half-waves while the transistor switch suppresses the respective other half-waves.

3,787,756

INRUSH CURRENT LIMITING CIRCUIT

James K. Berger, Sherman Oaks, Calif., assignor to Pioneer Magnetics, Inc., Santa Monica, Calif.

Filed Jan. 19, 1973, Ser. No. 324,959
Int. Cl. H02m 1/18
U.S. Cl. 321—11 9 Claims



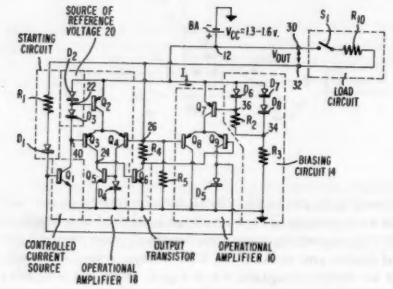
An inrush current limiting circuit is provided for use with transistorized high voltage power supplies to permit such power supplies to use capacitor input filters. The inrush current limiting circuit of the invention prevents the creation of a large inrush charging current to the capacitor input filter when the power supply is first energized, and which would otherwise be liable to cause damage to switches and relays in the power supply. The current limiting circuit to be described includes one or more silicon controlled rectifiers in series with the input of the filter, and it also includes a control circuit connected to the silicon controlled rectifiers and to the capacitor input filters. The control circuit serves to control the firing

point of the silicon controlled rectifiers relative to successive half cycles of the rectified alternating current input when the power supply is first turned on, so as to cause the silicon controlled rectifier to fire at different points during each successive half cycle. This control serves to maintain the current flow into the filter at an acceptable level at all times.

3,787,757
CIRCUIT FOR SUPPLYING REGULATED POWER UPON DEMAND

Abel Ching Nam Sheng, Morris Plains, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 5, 1973, Ser. No. 329,618
Int. Cl. G05f *1/56, 1/66*
U.S. Cl. 323—4 **30 Claims**

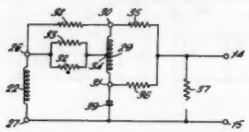


A load circuit requires regulated power during relatively short, relatively widely spaced, time intervals. In the absence of a demand for power, a control circuit drawing infinitesimal quiescent current inactivates a regulator circuit connected to the load circuit. When there is a demand for regulated power, the regulator circuit senses this demand and turns on and the control circuit senses a flow of current to the load circuit and in response thereto, locks the regulator in its "on" condition.

3,787,758
APPARATUS INCLUDING DISPLACEMENT-RESPONSIVE INDUCTIVE-TRANSDUCERS

Robin Ashby, Stroud, and Terence Ernest Adams, Cheltenham, both of England, assignors to Smiths Industries Limited, London, England

Filed Jan. 24, 1972, Ser. No. 220,093
Int. Cl. G01c *19/28*
U.S. Cl. 323—51 **5 Claims**

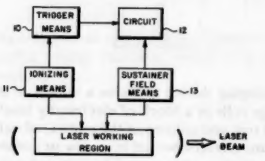


A rate gyroscope includes an inductive pick-off that has, in addition to a main secondary winding providing an output in accordance with input rate to the gyroscope, a further secondary winding that provides a signal to back off undesired output from the main winding at zero input-rate. A thermistor is connected in series with the main winding to compensate the gyroscope scale-factor for ambient temperature variations, and at least a proportion of the signal supplied by the further winding is applied in series with a resistor across the thermistor to compensate for variation from one temperature to another in the zero-rate output. The thermistor may be connected between one end of the main winding and a tap on the further winding or between one end of the further winding and an output terminal of the gyroscope. The further winding may be provided as a secondary winding of a separate transformer that is energized in parallel with the pick-off, and where the thermistor is connected to a center-tap of this winding the two ends of the winding may be connected to one output terminal of the circuit by two resistors respectively.

3,787,759
METHOD OF AND APPARATUS FOR MEASURING THE PURITY OF THE GASEOUS MEDIUM IN GAS LASERS

Diarmaid H. Douglas-Hamilton, Boston, Mass., assignor to AVCO Corporation, Cincinnati, Ohio

Filed Nov. 20, 1972, Ser. No. 308,272
Int. Cl. G01r *31/22*
U.S. Cl. 324—25 **10 Claims**

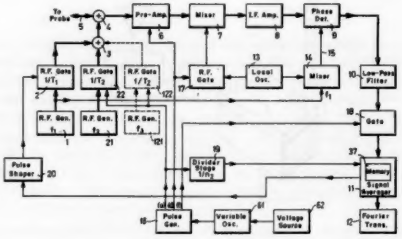


A method of and apparatus for determining the gas purity in gas lasers comprising means for producing free electrons or ionization as by a broad electron beam or the like in combination with further means for producing an electrical sustainer field, wherein in the presence of the sustainer field the production of free electrons or ionization is sharply terminated and the previously flowing sustainer field current is measured, the decay characteristics of the sustainer field current after termination of the production of free electrons being indicative of the presence or absence of substances adversely affecting the electron number density.

3,787,760
METHOD AND APPARATUS FOR RECORDING SPIN RESONANCE SPECTRA USING TWO SEQUENCES OF RF EXCITING PULSES

Toni W. Keller, Fallanden, and Werner H. Tschopp, Forch, both of Switzerland, assignors to Spectrospin A.G., Zurich, Switzerland

Filed June 2, 1972, Ser. No. 259,275
Claims priority, application Germany, June 9, 1971, 2128663
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 R **25 Claims**



A method and apparatus are described for performing pulsed double resonance analyses such as selective saturation and homonuclear decoupling. The method comprises exciting

the spins of a spin system in a sample with a series of RF pulses, exciting selected spins of the spin system with an RF signal having frequency components at approximately the Larmor (or resonance) frequencies of the selected spins, receiving the resultant free precession decay signals (or interferograms) of the resonant frequencies generated by the excitations, averaging a plurality of the free precession decay signals, and Fourier analyzing the mean value of the free precession decay signals to determine the spectral response. The excited spin system may be the set of spins associated with one type of nuclei in a sample. Apparatus for carrying out the method includes an RF generator and RF gate for producing a series of RF pulses to excite all the spins of the spin system, and at least one additional RF generator and RF gate for producing an RF oscillation to selectively excite only certain spins of the spin system.

3,787,761

METHOD OF DETECTING MAGNETIC ADDITIVES IN NUCLEAR FUEL MATERIAL BY NOTING CHANGE IN WEIGHT OF MATERIAL WHEN WEIGHED IN A MAGNETIC FIELD

Leonard N. Grossman, Livermore, and Douglas R. Packard, Sunol, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed May 15, 1972, Ser. No. 253,298
Int. Cl. G01r *33/12*
U.S. Cl. 324—34 R **10 Claims**

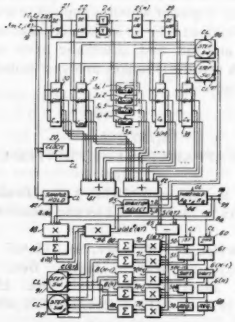
A rapid, non-destructive method of detecting additives in a qualitative and a quantitative manner in a nuclear fuel material is disclosed. This method is based upon the magnetic susceptibility of certain additives in nuclear fuel which are monitored for quality control purposes. The method gives a comparison of the weight of the nuclear fuel material versus the weight of the nuclear fuel material when disposed in a magnetic field. This enables a calculation of the change in weight of the nuclear fuel material in the presence of a magnetic field for comparison with a calibration of weight changes for known additions of the additive. In a particularly preferred embodiment of the invention, a method is used for the non-destructive qualitative and quantitative detection of gadolinium, a burnable poison additive in nuclear fuel materials.

3,787,762

SELF-ADAPTIVE EQUALIZER FOR QUADRATURE AMPLITUDE MODULATED SIGNALS

Yoichi Sato, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed June 23, 1972, Ser. No. 265,714
Claims priority, application Japan, June 28, 1971, 46-46296
Int. Cl. H04b *1/10*
U.S. Cl. 325—42 **8 Claims**



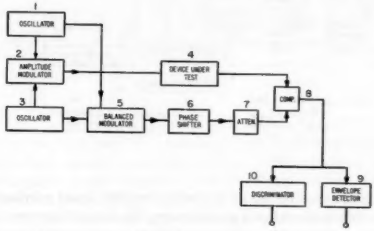
An equalizer for a demodulated quadrature amplitude modulated signal comprises first sampling means for deriving a sole demodulated signal sample $Z(kT)$ at each of the sampling times kT [$Z(t)$, a signal of complex amplitudes; T, the discrete code signal interval; $t = 0$, the time of occurrence of arbitrary one of maximum absolute values of the complex amplitude of the demodulated signal; k, integers], second sampling means for simultaneously deriving a predetermined number, $2N + 1$, of simultaneous demodulated signal samples $Z(kT - hT)$ at each of the sampling times [$h = -N, \ldots, 0, 1, \ldots, N$], variable gain means for simultaneously deriving a plurality of amplitude varied signal samples $C_h \cdot Z(kT - hT)$ from the simultaneous samples at each of the sampling times, summing means for deriving a summation of the amplitude varied signal samples at each of the sampling times, and adjusting means for adjusting the variable gains C_h with reference to the sampling times, the sole demodulated signal samples, and the summations of the amplitude varied signal samples.

3,787,763

APPARATUS FOR MEASURING CONVERSION OF AMPLITUDE MODULATION TO PHASE MODULATION

Robert Coackley, Dalgety Bay, Scotland, assignor to Hewlett-Packard Ltd., South Queensferry, West Lothian, Scotland

Filed Aug. 24, 1972, Ser. No. 283,602
Claims priority, application Great Britain, Oct. 13, 1971, 47,552/71
Int. Cl. G01r *27/00*
U.S. Cl. 324—57 R **8 Claims**



This apparatus measures conversion of amplitude modulation to phase modulation and is useful where resultant unwanted phase modulation is to be measured, but is mainly intended for testing devices used in 70 MHz frequency modulated communications systems where, for example, the amplitude modulation to phase modulation conversion of limiters and other devices cause distortion of the desired frequency modulated signal.

3,787,764

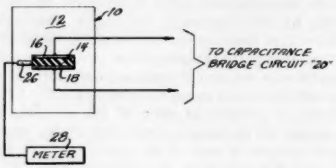
SOLID DIELECTRIC CAPACITANCE GAUGE FOR MEASURING FLUID PRESSURE HAVING TEMPERATURE COMPENSATION AND GUARD ELECTRODE

Carl G. Andeen, Euclid, Ohio; John J. Fontanella, Annapolis, Md., and Donald E. Schuele, Columbus, Ohio, assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Dec. 3, 1971, Ser. No. 204,578
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 P **4 Claims**

Pressure in a fluid is measured by measuring the dielectric constant of a solid dielectric disposed in the fluid. Two elec-

trodes are each mounted on an opposing side of the dielectric and the capacitance therebetween monitored to provide a



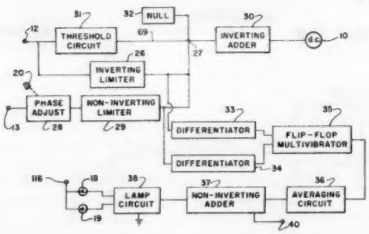
measure of the dielectric constant of the dielectric material and hence pressure in the fluid.

3,787,765

DIRECT READING PHASE METER

Robert S. Morrow, Columbus; Lloyd D. Penn, Johnstown, and Arthur D. Marcum, Gahanna, all of Ohio, assignors to IRD Mechanalysis Inc., Worthington, Ohio

Filed Jan. 12, 1972, Ser. No. 217,165
Int. Cl. G01r 25/00
U.S. Cl. 324—83 A 8 Claims



A direct reading meter for indicating the phase relationship of two input electrical signals having the same frequency. The meter employs a DC voltmeter with two scales over its range. The meter also is provided with an indicator, such as two different lamps, for indicating which one of the two scales is concurrently applicable to the meter indication.

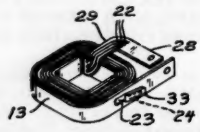
A threshold limiter may be provided to deactivate the meter unless the amplitude of one of the input signals exceeds a preestablished minimum value.

3,787,766

METER MAGNET WITH STRIP-WOUND CURRENT COIL

Russell F. Graefnitz, Lafayette, and Glenn G. Lohrman, Delphi, both of Ind., assignors to Duncan Electric Company, Inc., Lafayette, Ind.

Filed Feb. 22, 1972, Ser. No. 228,094
Int. Cl. G01r 11/06; H01f 15/10
U.S. Cl. 324—137 10 Claims



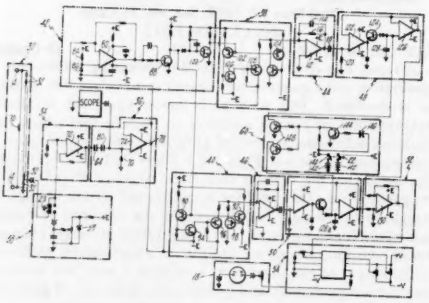
The coils for a meter current magnet are each formed from a strip of copper, with insulative coating, wound upon itself. A lead-in from its inner end is formed by the strip itself which is extended out around the coil. Flat bends (within the plane of the portion of bent strip) are made possible by forming the blank for the coil with parallel slots in the area to be thus bent. A tie for the outer layer comprises a tongue on the next layer extending through a slot in the outer layer, insulated from it by a plastic sleeve. The wound coils are insulatively coated and insulated from the magnet core and protected from its edges by molded nylon isolators of split-sleeve nature which, in final positioning, are interlocked with the coils for mutual positioning. The coil is outstandingly economical of copper without overheating.

3,787,767

DEFIBRILLATOR OUTPUT ENERGY MEASURING CIRCUIT

Leslie G. Hammer, Bristol, and Charles A. Reynolds, Jr., New Haven, both of Conn., assignors to Pioneer Medical Systems, Inc., New Britain, Conn.

Filed Oct. 15, 1971, Ser. No. 189,554
Int. Cl. G01r 21/00
U.S. Cl. 324—142 10 Claims



A universal portable analyzer for defibrillators giving a direct readout, in watt-seconds, of electrical energy pulses regardless of wave shape and polarity. A voltage divider input attenuates the signal and feeds it through gain and buffer stages.

A zero crossing detector gates switching networks for sequentially passing positive and negative signal components respectively to separate integrators which generate outputs proportional to the total positive and negative current of the input pulse. These outputs are stretched so that they occur simultaneously, are added together and squared to provide a signal porportional to power which is applied to a watt-second meter for direct readout. The solid state circuits include automatic ON-OFF control, and automatic zero reset at the beginning of each test cycle makes analyzer suited for use by non-technical personnel.

3,787,768

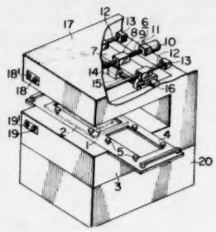
INSPECTION APPARATUS FOR PRINTED CIRCUIT BOARDS

Tadashi Kubota, Katano, and Michio Kato, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Dec. 21, 1971, Ser. No. 210,457
Claims priority, application Japan, Dec. 25, 1970, 45-130069; Dec. 25, 1970, 45-141212; Dec. 25, 1970, 45-141213; Dec. 25, 1970, 45-141214; Dec. 25, 1970, 45-141215
Int. Cl. G01r 31/28
U.S. Cl. 324—158 F 6 Claims

A printed circuit board inspection apparatus for automatically inspecting the electrical continuity of a printed circuit

printed on and through-holes formed in a substrate board according to a predetermined program prior to mounting electric parts in the through-holes to form a desired electric circuit, which is so constructed as to ensure the electrical continuity of the printed circuit printed on and through-holes formed in a substrate board.



3,787,769

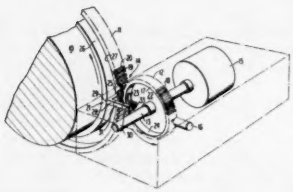
NON-CONTACTING SHAFT RPM AND DIRECTION OF ROTATION MEASUREMENT SYSTEM

James R. Parkinson, R.D. 3, Vergennes, Vt.

Filed Aug. 1, 1972, Ser. No. 277,117

Int. Cl. G01p *3/54*

U.S. Cl. 324—174 **17 Claims**



A toothed exciter wheel is rotatably driven continuously in close proximity to a toothed speed reference wheel mounted on a rotatably driven power shaft, the system having a first sensor to sense the algebraic sum of the speeds of the two wheels, a second sensor to sense the speed of the exciter wheel and a circuit arrangement that compares the output signals of the two sensors and provides an indication on a readout device of the speed and direction of rotation of the power shaft.

3,787,770

METHOD AND APPARATUS FOR DETECTING A PROJECTILE LEAVING THE BARREL OF A GUN

Paul Cote, and Charles A. Roy, both of Quebec, Ontario, Canada, assignors to Her Majesty the Queen, in right of Canada as represented by the Minister of National Defence of Her Majesty's Canadian Government

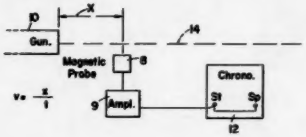
Filed June 19, 1972, Ser. No. 264,222

Claims priority, application Canada, Sept. 23, 1971, 123,528

Int. Cl. G01p *3/66*; G04f *9/06*; G01l *5/14*

U.S. Cl. 324—178 **8 Claims**

A method and apparatus for detecting a projectile leaving a gun using a permanent horse-shoe magnet located at or near the muzzle of the gun whereby the projectile cuts some of the magnetic lines of force of the magnet. Resultant voltage pulses from the separation of the projectile from the gun and from the passage of the projectile above the permanent magnet are induced in a pick up winding wound on the magnet and these are fed through an amplifier to an oscilloscope and/or a chronograph to provide an indication. The apparatus may also be utilized to measure the velocity of and to photograph the projectile as it leaves the muzzle of the gun.



3,787,771

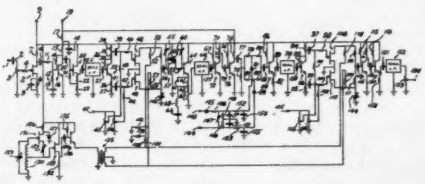
SINGLE-CHANNEL NOISE SUPPRESSOR

Edward O'Connor, 10212 Plymouth Ave., Cleveland, Ohio

Filed Nov. 24, 1969, Ser. No. 879,332

Int. Cl. H04b *15/00*

U.S. Cl. 325—65 **6 Claims**



A signal containing low-level noise, whose frequency components are contained in a band of frequencies which may be considerably greater than one octave, as for example, audio from a phonograph record, is converted to a higher band of frequencies whose range is less than or equal to one octave, as for example, by a modulator and a high-pass filter. The converted band of frequencies is transmitted to a threshold device designed to reject any signal below a predetermined threshold value. The output of the threshold device is, accordingly, free of signals corresponding to the original low-level noise contained in the low-frequency band signal. The output of the threshold device is then reconverted to the original band of frequencies, as for example, by a modulator and low-pass filter, to produce an output identical to the original signal except for the absence of the low-level noise. This output signal is free of the harmonic distortion which would result if the original signal was merely applied directly to the threshold device.

3,787,772

F. M. TRANSMITTER EMPLOYING MAGNETICALLY MODULATED FERRIMAGNETIC RESONATOR

James W. Sedin, Mountain View, Calif., assignor to Ryka Scientific, Inc., Sunnyvale, Calif.

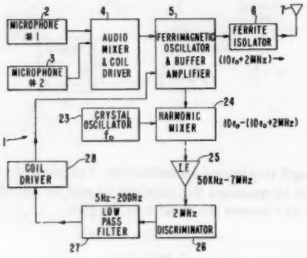
Filed June 5, 1972, Ser. No. 259,485

Int. Cl. H04b *1/04*

U.S. Cl. 325—171 **6 Claims**

A ferrimagnetic crystal resonator is employed as the frequency determinative element of a radio frequency oscillator. The ferrimagnetic crystal is disposed in the gap of a magnet and the magnetic field is modulated in intensity in accordance with an audio AM signal to be impressed on the carrier. The audio AM modulation of the magnetic field of the magnet is converted into frequency modulation of the carrier frequency of the ferrimagnetic crystal controlled oscillator.

An internally generated stable reference radio frequency signal is compared with a sample of the FM output signal to



produce an error signal for correcting the average magnetic field intensity for controlling the average or carrier frequency of the FM transmitter.

3,787,773

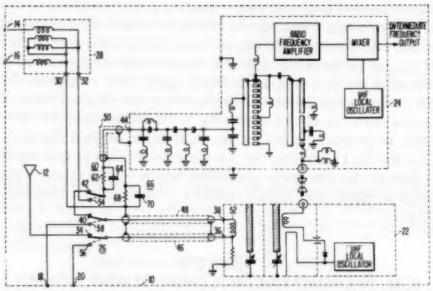
SWITCHABLE ANTENNA CIRCUIT FOR TELEVISION PROVIDING FOR RECEPTION OF UHF AND VHF SIGNALS UTILIZING A SINGLE BUILT-IN MONOPOLE ANTENNA OR TWO EXTERNAL ANTENNAS

Eugene Ernst Janson, and Max Ward Muterspaugh, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 11, 1972, Ser. No. 288,203

Int. Cl. H04b *1/06*

U.S. Cl. 325—370 **4 Claims**



A television receiver for UHF and VHF television reception includes a built-in monopole antenna and first and second pairs of external antenna terminals for connection to external UHF and VHF antennas, respectively. A switch is provided which is operative in a first position to connect the monopole antenna through the input circuitry of the UHF tuner to the VHF tuner so that the monopole antenna provides UHF and VHF television signal inputs to UHF and VHF tuners. In the second position, the first and second pairs of external antenna terminals are individually connected to the appropriate one of the UHF and VHF tuners.

3,787,774

FILTER CIRCUITRY

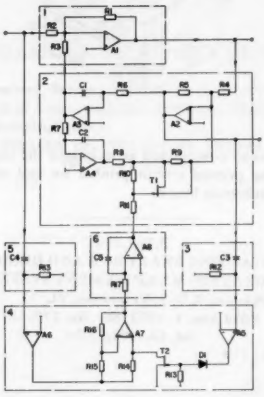
Ulrich Tietze, Erlangen; Erich Courtin, Sindelfingen, and Stefan Traub, both of Boblingen, all of Germany, assignors to Hewlett-Packard GmbH, Boblingen, Germany

Filed Aug. 28, 1972, Ser. No. 284,389

Claims priority, application Germany, Aug. 31, 1971, 2143560

Int. Cl. H03b *1/04*

U.S. Cl. 328—167 **9 Claims**



Circuitry for filtering a distinct variable spectral component includes a band-rejection filter formed by a summing amplifier with a feedback loop and a bandpass-filter connected to one of its inputs. The summing amplifier is connected to form the difference between the unfiltered spectrum at one of its inputs and the spectrum component to be suppressed at another of its inputs. The summing amplifier delivers the filtered signal spectrum at its output. A control circuit locks the common center frequency of the bandpass and band-rejection filters to the frequency of the spectral component to be suppressed.

3,787,775

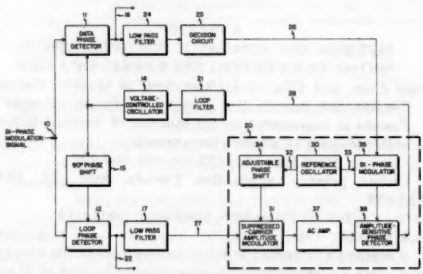
PHASE CORRECTION CIRCUIT

Ronald L. Lanning, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 28, 1973, Ser. No. 345,668

Int. Cl. H03d *3/24*; H03b *3/04*

U.S. Cl. 329—122 **6 Claims**



A phase correction circuit for a demodulator for a phase-shift keying, suppressed-carrier communication system. The

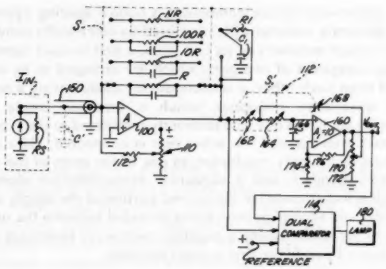
demodulator for such a coherent phase detector requires means for reintroducing the carrier in proper phase and frequency. To this end a phase-locked loop demodulator is conventionally used including a phase correction circuit sometimes called an I-Q multiplier. The invention provides an improved phase correction circuit which will generate a phase-corrected loop error signal to keep the phase-locked loop locked in phase even during the period when the input signal reverses its polarity. The phase correction circuit includes a reference oscillator and hence operates at an alternating-current signal rather than a direct-current signal.

3,787,776

HIGH SPEED CURRENT AMPLIFIER

Pieter G. Cath, Orange Village, and Gary E. Angeline, Euclid, both of Ohio, assignors to Keithley Instruments, Inc., Solon, Ohio

Filed Oct. 6, 1971, Ser. No. 186,922
Int. Cl. H03f 19/00
U.S. Cl. 330—2 **2 Claims**



A high speed current amplifier is disclosed for purposes of amplifying current signals from a current source over a wide frequency band while minimizing generated noise. The amplifier employs amplifying circuitry having an input adapted to be connected to a current source and an output, with the amplifying circuitry exhibiting an open loop gain of A. A resistive feedback path is employed, which exhibits a resistance R, connected between the input and output so that the amplifying circuitry would normally exhibit a useful band width extending to roll-off frequency F_1 where $F_1 = A/(2\pi RC)$, with C being the shunt capacitance across the amplifier input. An attenuator is connected to the output of the amplifier for purposes of attenuating high frequency noise components above frequency F_2, where F_2 is less than frequency F_1 and at a rate greater than that of a single roll-off.

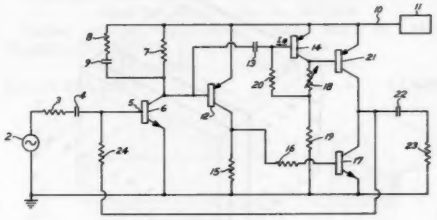
3,787,777

ELECTRIC AMPLIFIER

Peter A. Mercola, and William R. Jacobs, both of Wilmette, Ill., assignors to Beltone Electronics Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 61,196, Aug. 5, 1970, abandoned. This application Nov. 19, 1971, Ser. No. 200,544
Int. Cl. H03f 3/26
U.S. Cl. 330—15 **7 Claims**

An electronic circuit for reducing the distortion and increasing the temperature stability of amplifying transistors arranged in a push-pull configuration. The circuit preferably uses a driver transistor that is matched to the push-pull transistor which it drives in order to increase temperature stability. A capacitor is connected in series with the input lead of the driver transistor. Due to the non-linearity of the drive transistor input characteristics, the d. c. voltage level stored on the capacitor is varied in proportion to the magnitude of the input signal. As a result, the operating point of the push-



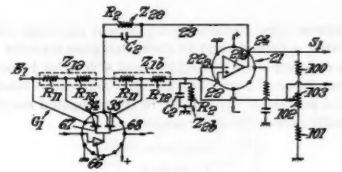
pull transistors is continuously adjusted in proportion to the magnitude of the input signal, whereby cross-over distortion is reduced.

3,787,778

ELECTRICAL FILTERS ENABLING INDEPENDENT CONTROL OF RESONANCE OF TRANSISITION FREQUENCY AND OF BAND-PASS, ESPECIALLY FOR SPEECH SYNTHESIZERS

Rene Carre; Jean-Pierre Beauviala, both of Grenoble, and Jean Paille, Seyssinet, all of France, assignors to Agence Nationale De Valorisation De La Recherche (Anvar), Courbevoie, France

Continuation-in-part of Ser. No. 47,287, June 18, 1970, abandoned. This application Nov. 1, 1971, Ser. No. 194,427
Claims priority, application France, Oct. 30, 1970, 7039299; June 20, 1969, 6920702
Int. Cl. H03f 1/36
U.S. Cl. 330—86 **16 Claims**



The filter comprises an amplifier of gain G of which the input is connected to a first pair of similar series connected impedances and whose impedance values are related by a constant *a*, and a second pair of similar impedances whose impedance values are related by a constant *b*, one of the latter pair of impedances being provided in a negative feedback loop and the other being shunted between the amplifier provided in the input and reference potential. The filter G and the aforesaid impedance values are characterized by the relationship $1+a-b(G-1)=0$.

3,787,779

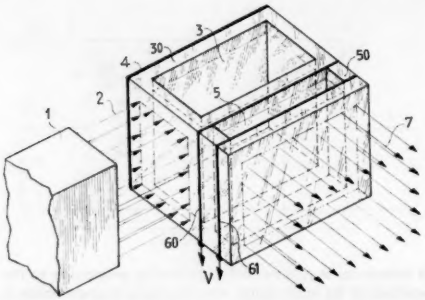
ADJUSTABLE WAVELENGTH OPTICAL SOURCE USING THE SIMULATED EMISSION EFFECT

Erich Spitz, and Daniel B. Ostrowsky, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 14, 1972, Ser. No. 243,948
Claims priority, application France, May 14, 1971, 7117558
Int. Cl. H01s 3/10
U.S. Cl. 331—94.5 **1 Claim**

The present invention relates to stimulated emission radiation sources and, more precisely, to a dye laser in which the

wavelength of the radiation emitted is varied by modifying the voltage applied to a thin film of a cholesteric liquid crystal



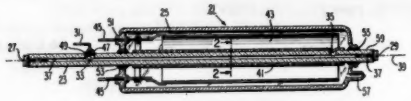
which replaces one of the mirrors of the resonant optical cavity. This invention can be used as an adjustable wavelength coherent radiation source.

3,787,780

ELECTRON TUBE HAVING INTERNAL GLASS MEMBER COATED WITH CRYSTALLINE CERAMIC MATERIAL

John Arthur Powell, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed July 24, 1972, Ser. No. 274,639
Int. Cl. H01s *3/02, 3/22*
U.S. Cl. 331—94.5 **8 Claims**



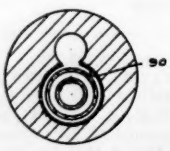
An electron tube comprising a gas-tight envelope containing an anode, a cathode and an elongated glass member which normally deforms when heated to about 450°C for 16 hours. A continuous layer of crystalline ceramic material is fused to a substantial portion of the surface of the elongated member to substantially reduce the deformation.

3,787,781

EXTERNAL CATHODE/INTERNAL ANODE FIGURE EIGHT LASER

Gustav K. Medicus, and Onezime P. Breaux, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 7, 1972, Ser. No. 278,330
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 D **2 Claims**



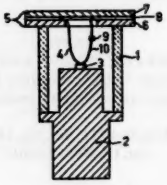
A transverse-discharge slotted hollow cathode gaseous laser having an external cathode with the anode contained within the confines of the cathode provides an easily cooled, stabilized (non-thermionic-emitting) cold-cathode, rugged, "all metal" laser.

3,787,782

MICROWAVE DEVICE

Hindrik Tjassens, Emmasingle, Eindhoven, Netherlands

Filed Aug. 15, 1972, Ser. No. 280,764
Claims priority, application Netherlands, Aug. 23, 1971, 7111600
Int. Cl. H03b *7/06*
U.S. Cl. 331—107 R **4 Claims**



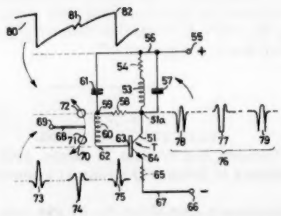
A microwave device comprising a hollow spacing cylinder of a dielectric material which is closed by electrically conductive contact members on its end faces, a first contact member being composed of two parts which are arranged to be insulated from each other, a semiconductor diode having a negative microwave resistance which is arranged inside the cylinder such that one side is directly connected to the second contact member and the other side is connected, via a first portion of a supply conductor, to one of the parts of the first contact member, and a capacitive semiconductor element which is incorporated in the second portion of the supply conductor, said second portion being provided between the other side of the diode having a negative microwave resistance and the second part of the first contact member.

3,787,783

TIME-KEEPING DEVICE WITH TRANSISTOR CONTROL USING OSCILLATING MAGNET

Edmund Ketterer, Hansjakob Strasse 7, 7712 Blumberg/Schwarzwald, Germany

Filed Apr. 21, 1972, Ser. No. 246,383
Claims priority, application Germany, Apr. 21, 1971, 2119299
Int. Cl. G04c *3/00;* **H03b** *5/30*
U.S. Cl. 331—116 M **18 Claims**



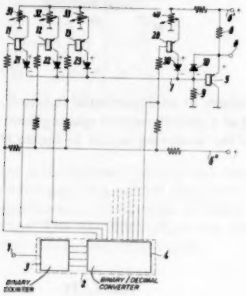
A drive arrangement for an electronic time-keeping device in which a rotor member is juxtaposed with a stator member, one of the members being provided with a pair of coils including a sensing coil (pick-up coil) and a drive coil. The other member carries a pair of oppositely poled magnets cooperating with the coils. A NPN transistor has a collector-emitter network in series with the direct-current source and the drive coil while the sensing coil is connected in a base-collector network of the transistor.

3,787,784

CIRCUIT ARRANGEMENT FOR APPLYING A TEMPERATURE STABILIZED VOLTAGE TO A VOLTAGE SENSITIVE COMPONENT

Hans Mangold, and Walter Klein, both of Fuerth, Germany, assignors to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig, Fuerth, Bayern, Germany

Filed Feb. 15, 1972, Ser. No. 226,464
Claims priority, application Germany, Feb. 18, 1971, 2107714
Int. Cl. H03b 5/00
U.S. Cl. 331—177 V 8 Claims



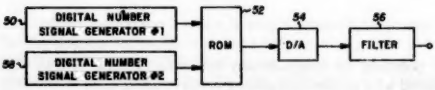
A selected one of a plurality of temperature stabilized tuning voltages is applied at a tuning output to a resonant circuit for varying the frequency thereof. Each tuning voltage is selectively applied to the tuning output by a switching transistor and an isolating diode. All isolating diodes have one electrode connected to a common line. A temperature compensating diode or the base emitter circuit of a temperature compensating transistor are connected between the common line and the tuning output. A single temperature compensating element thus compensates for temperature variations in any of the diodes.

3,787,785

PHASE REPRESENTATIVE DIGITAL SIGNAL MODULATING APPARATUS

Larry F. Bass, Mission Viejo, Calif., assignor to Collins Radio Company, Dallas, Tex.

Filed May 15, 1972, Ser. No. 253,094
Int. Cl. H04l 27/20
U.S. Cl. 332—9 R 9 Claims



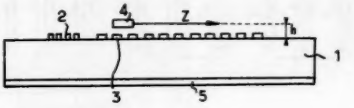
Apparatus for combining two series of digital numbers from each of two different sources wherein the numbers represent phases of signals and for providing an output indicative of the modulation of one of the signals by the other signal with the output being an analog or digital number signal. The concept generally is shown in detail as applied to a differential phase shift keying transmitter where one of the sources of digital numbers is a time division multiplexed source of two signals and the other is a time base or clocking signal which modulates each of the time multiplexed signals from the first source on a raised cosine basis through the use of a look-up table in the form of a read only memory.

3,787,786

CONTINUOUSLY VARIABLE ULTRASONIC DELAY LINE

Andre Defebvre; Gerard Leman, and Jean-Francois Pouliquen, all of Lille, France, assignors to Etat Francais, Paris, France

Filed Nov. 9, 1972, Ser. No. 304,950
Claims priority, application France, Nov. 10, 1971, 71.40292; Oct. 31, 1972, 72.38716
Int. Cl. H03h 9/20, 9/30; H01v 7/00
U.S. Cl. 333—30 R 7 Claims



Delay line comprising an extended piezoelectric element and two input and output electrode systems cooperating with the surface of this element, characterized in that at least one of the two systems comprises at least one movable part which follows the longitudinal direction of the piezoelectric element, this movable part forming an upper electrode situated close to the active face of the piezoelectric element.

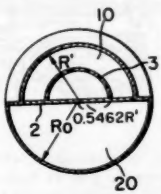
Application to the realization of ultrasonic delay lines with continuous variation.

3,787,787

CIRCULAR WAVEGUIDE MODE FILTER

Sadakuni Shimada; Kunio Hashimoto; Ken Kondoh, all of Tokyo, and Masaki Koyama, Sayama, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed July 14, 1972, Ser. No. 272,037
Claims priority, application Japan, July 19, 1971, 46/53688
Int. Cl. H01p 1/16, 1/18
U.S. Cl. 333—98 M 10 Claims



A circular waveguide mode filter is provided which comprises a circular waveguide consisting of an upper and lower semicircular waveguide sections and in which dielectrics or magnetic materials are disposed in either of the upper or lower waveguide sections or in both of them in a special spatial relation with them so that the desired TE_{01} signal mode may be propagated through the waveguide while the undesired TE_{0n} (where $n \geqq 2$) modes are absorbed.

3,787,788

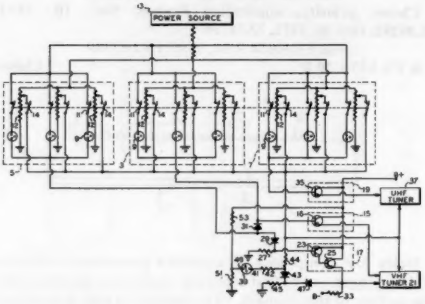
VARACTOR TUNER BAND SWITCHING AND SIGNAL INDICATING CIRCUITRY

Paul Eshelman Le Fevre, Pavilion, N.Y., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Jan. 26, 1973, Ser. No. 326,829
Int. Cl. H03j 3/06
U.S. Cl. 334—14 9 Claims

A signal receiver having VHF and UHF varactor tuners and a channel indicating group for the upper and lower VHF chan-

nels and for the UHF channel includes band switching circuitry for selectively coupling a plurality of power sources to the tuners in accordance with activation of a particular channel indicating group. Also, the band switching circuitry is utilized in conjunction with a channel indicating meter circuit for providing a visual indication of the channel selected in each one of the channel indicating groups.



3,787,789

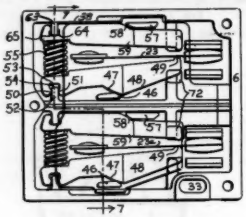
SWITCHING MECHANISM

John L. Harris, Clearwater, Fla., assignor to Deltrol Corp., Bellwood, Ill.

Filed Oct. 24, 1972, Ser. No. 300,122

Int. Cl. H01h *3/60*

U.S. Cl. 335—193 **19 Claims**



A plug in relay is provided in which the switches are mounted directly on the plug in base, the supports for the switch blades and stationary contacts extending through the base and forming the plug in terminals. The switches are positively operated by levers on each side of the blades. These levers have camming surfaces which are acted on by abutments formed on a slide attached to a solenoid. The camming surfaces are non-linear to cause contact closure at a relatively slow rate with high initial contact pressure to prevent contact bounce. Strain relief for overtravel is provided by movable pivots for the levers held in normal position by a spring.

3,787,790

MAGNETIC MASS SPECTROMETER WITH SHAPED, UNIFORMLY SATURATING MAGNETIC POLES

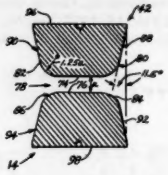
Charles W. Hull, Sierre Madre, and Charles R. McKinhey, Monrovia, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 15,186, Feb. 27, 1970, Pat. No. 3,699,332. This application July 17, 1972, Ser. No. 272,647

Int. Cl. H01f *7/00*

U.S. Cl. 335—210 **6 Claims**

A magnetic mass spectrometer having a magnetic analyzing sector utilizing shaped magnet poles of a specific configuration so as to produce uniform magnetization of the pole material and constant flux distribution at all magnetic field strengths. The magnet poles are shaped such that the surfaces thereof conform to an exponential function. Magnetic shunts are located at a predetermined spacing from the entrance and exit end of the analyzing sector to locate the magnetic field boundary.



3,787,791

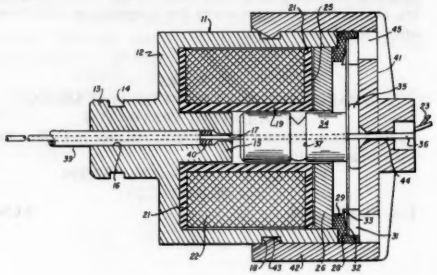
SOLENOID FOR WIRE PRINTER

Jurgen Herman Borger, and Rafael A. Castellanos, both of Chicago, Ill., assignors to Victor Comptometer Corporation, Chicago, Ill.

Filed Oct. 30, 1972, Ser. No. 301,774

Int. Cl. H01f *7/08*

U.S. Cl. 335—274 **11 Claims**



Solenoid for longitudinally actuating printing wire in high speed wire printer comprising metal housing open at one end, a coil in the housing, an annular pole piece substantially closing open end of housing to eliminate air gap in flux path, a plunger secured to print wire by swaging to avoid degrading its magnetic characteristics and movable within and axially of coil and pole piece, a flat tempered steel spring engaging plunger to retain same in inactive position and to return it thereto following energization of the coil, a plastic spring seat formed as a ring mounted in open end of housing with recesses receiving ends of spring, and a plastic cap mounted over open end of housing in snap-fit engagement therewith, the cap and housing having axial bores to accommodate printing wire, with an enlarged outer portion of housing bore receiving a plastic bearing and the end of a plastic tube slidably encasing a major portion of the wire.

3,787,792

COIL FORMER FOR A TRANSFORMER

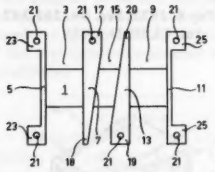
Nicolaas Johannes DeJong, and Mannes Arie, both of Middelkamp, Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1973, Ser. No. 341,984

Claims priority, application Netherlands, Mar. 22, 1972, 7203795

Int. Cl. H01f 15/10, 27/30

U.S. Cl. 336—192 4 Claims



A coil former for a transformer having four flanges which are consecutively arranged on a central part, each of the two intermediate flanges having a thick edge in which a connection pin is connected. The two thick edges are diametrically arranged on opposite sides of the central part.

3,787,793

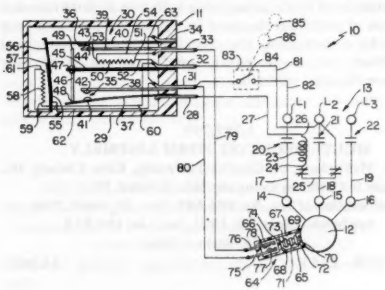
BIMETAL ELECTRICAL SWITCH

James R. Willson, Trumbull, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 10, 1972, Ser. No. 216,685

Int. Cl. H01h 37/04, 37/52

U.S. Cl. 337—44 10 Claims



A control system for a motor having a required oil pressure for the safe operation thereof, the system having a time delay switch for interconnecting an electrical source to the motor to operate the same each time the time delay switch is initially activated by being placed across the power source. The time delay switch has a time delay bimetal means that is adapted to move and open the switch if the oil pressure of the motor does not reach the required value within a predetermined time period from the initial activation of the time delay switch. An oil pressure responsive switch is operatively interconnected to the time delay bimetal means and to the motor to terminate the switch opening movement of the time delay bimetal means if the oil pressure reaches the predetermined value thereof during the predetermined time period so that the motor will be continuously operated as long as the system is not manually or automatically turned off or the oil pressure does not fall below the predetermined value thereof.

3,787,794

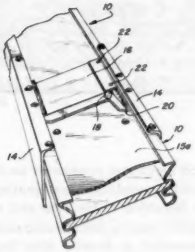
TOP COVER FOR A BUS DUCT JOINT

John E. Schmidt, deceased, late of Oxford, Ohio; Margaret J. Schmidt, Legal Representative, Lexington, Ky., and George N. Jorgensen, Oxford, Ohio, assignors to Square D Company, Park Ridge, Ill., by said Jorgensen

Filed Jan. 12, 1973, Ser. No. 322,999

Int. Cl. H01r 13/60

U.S. Cl. 339—22 B 3 Claims



A two-part hinged cover is inserted between the opposite flanges of the tops of a pair of connected bus duct sections at the joint therebetween and straightened to abut their top surfaces. The cover is locked in the straightened position by a pair of screws. A gasket secured to the cover forms a seal between the top surfaces of the bus duct sections and the cover.

3,787,795

SOLDERLESS TERMINAL ASSEMBLY

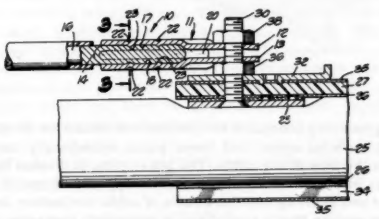
John T. Thompson, 244 Loring St., Los Angeles, Calif., and George W. Gillemot, 2331 20th St., Santa Monica, Calif.

Continuation of Ser. No. 80,993, Oct. 15, 1970, abandoned.

This application Apr. 7, 1972, Ser. No. 241,993

Int. Cl. H01r 7/08

U.S. Cl. 339—14 R 27 Claims



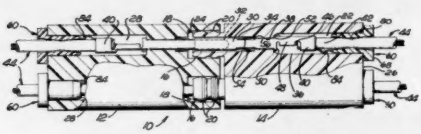
A solderless terminal strip of U-shaped, tempered, resilient metal having an opening in its bight for receiving the end of a conductor and clamping the same between the legs thereof as the latter are clamped together. Sharp edged pimple-like protruberances bite into the conductor to assure electrical contact and a strong mechanical anchorage. The clip legs are formed with channels, lengthwise thereof, preferably non-linear and of a size firmly seating the similarly shaped end of a conductor. Smaller sized conductors are accommodated by selecting a split sleeve adapter of suitable size to telescope over the conductor and be clamped between the legs of the clip.

3,787,796

LOW COST SEALED CONNECTOR AND METHOD OF MAKING SAME

John E. Barr, Brea, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 17, 1972, Ser. No. 298,416
Int. Cl. H01r 13/52
U.S. Cl. 339—60 R 12 Claims



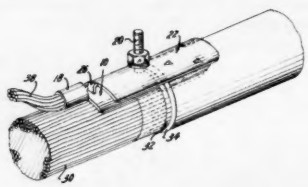
A low cost sealed electrical connector and method of making the same in which a conductor terminating in an electrical contact is slidably mounted in the rear end of a passage in a connector body and a radially deformable sealing element surrounding the conductor is forced into the annular space between the conductor and the wall of the passage to provide a seal therebetween. Preferably, the sealing element is attached to the conductor-contact assembly prior to inserting the assembly into the connector body. The invention may be used in any application where it is desired to seal a conductor within a wall or body. A special form of a sealing element is disclosed which assures a moisture-tight seal between the conductor and the body in which it is mounted.

3,787,797

GROUNDING CONNECTORS FOR SHIELDED CABLE

Adolph Kurz, 10 Highpoint Dr., Mountainside, N.J.

Filed Dec. 29, 1972, Ser. No. 319,301
Int. Cl. H01r 11/20
U.S. Cl. 339—95 R 7 Claims



A grounding connector for shielded and insulation-sheathed cable includes upper and lower plates cylindrically curved about the axis of the cable. The lower plate is divided by an off-set into a contact portion that is slipped underneath the shield and bears against the bundle of cable conductors, and a clamp portion that is spaced out of potentially damaging contact with the cable wires. A stud projects from the clamp portion of the lower plate adjacent the off-set through the upper plate and bears a nut for drawing the plates toward each other. The clamp portion of the lower plate has an integral solderless connector for a grounding conductor, providing a solid metallic path from the shield to the grounding conductor. Differing from other connectors of this class, there is no tendency for stresses applied to the grounding conductor to loosen the disclosed connector.

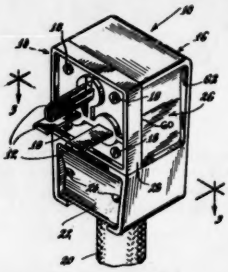
Special ridges are formed by grooves in the cylindrical outward-facing surface of the contact portion, one side of each ridge being in a plane perpendicular to the cylindrical axis and the other surface of each ridge sloping from the bottom of the groove toward the stud. There is a narrow crest between each groove and the next. The ridges facilitate insertion of the contact portion of the lower plate inside the cable shield, and yet the ridges resist mechanical pull-out stresses and provide stable electrical contact to the inside surface of the shield without cutting the shield.

3,787,798

HEAVY DUTY PLUG

Vincent L. Carissimi, Fairfield, Conn., and George H. Kress, Newark, N.J., assignors to Harrey Hubbell, Incorporated, Bridgeport, Conn.

Filed May 8, 1972, Ser. No. 251,347
Int. Cl. H01r 13/58
U.S. Cl. 339—107 6 Claims



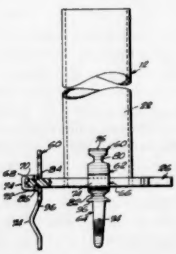
An apparatus for containing an electrical plug, particularly where a large force is required to either insert or withdraw the plug from a mating outlet. Gripping wells are disposed on opposite sides of the plug which provide both a protective lip and a gripping lip. The protective lip avoids arc burns and electrical shocks during plug insertion. The gripping lip facilitates the applicaton of force during plug withdrawal. Sophisticated fabricaton of parts and the need for additional parts are both avoided by constructing the plug from routine component parts which are cooperatively configured to create the gripping wells upon assembly.

3,787,799

MULTI-PIECE COIL FORM ASSEMBLY

Leroy F. McFarlane, St. Charles Township, Kane County, Ill., assignor to Coilform Company Inc., Geneva, Ill.

Continuation of Ser. No. 886,685, Dec. 19, 1969. This application Sept. 15, 1971, Ser. No. 180,813
Int. Cl. H01r 13/66
U.S. Cl. 339—214 R 4 Claims



A coil form assembly of multi-piece construction which includes a tube of distortion resistant thermo-setting material to

accommodate a coil wound thereabout, a thin washer of thermo-setting material secured intermediate the ends of the tube, and, for some installations, mounting means on the washer for connecting the assembly, for instance, to a pierced circuit board. The preferred mounting means are a plurality of lugs arranged in a pattern about the washer, each lug being of resilient material and having a jaw or mouthpiece provided with teeth to receive and to grip the peripheral margin of the washer. The lugs have a portion which, when so mounted to the washer, extend as legs in a pattern below the coil form assembly and are adapted to be received in the openings of a companionate pattern of a circuit board. The arrangement of the lugs circumferentially about the washer may be varied to meet any of the omnifarious conditions met in electronic or appliance installations.

3,787,800

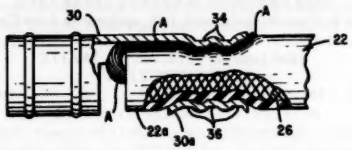
RESISTOR IGNITION LEAD

Robert A. Barker, and John W. Shank, both of Port Huron, Mich., assignors to Eltra Corporation, Brooklyn, N.Y.

Division of Ser. No. 315,464, Oct. 11, 1963, Pat. No. 3,284,751. This application Nov. 7, 1966, Ser. No. 595,305

Int. Cl. H01r *15/12*

U.S. Cl. 339—223 S **2 Claims**



The invention is directed to a non-metallic resistor ignition cable having a core including a conductive coating over strands of non-conductive material. The strands are impregnated with a conductive medium prior to or at the time of application of the conductive coating. Outer insulation is supplied which is stripped off to expose the coated strands. A terminal is applied to the stripped end of the cable by crimping a ferrule portion around the end of the outer insulation and the folded back coated strands.

3,787,801

DOUBLE THICKNESS P.C.B. FLAG TERMINAL

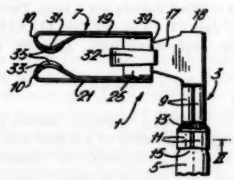
Wladimiro Teagno, and Franco Trevisiol, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 9, 1972, Ser. No. 224,832

Claims priority, application Italy, Feb. 24, 1971, 20976 A/71

Int. Cl. H05k *1/07*; H01r *11/22*

U.S. Cl. 339—258 R **2 Claims**



A unitary electrical terminal made from sheet material for a printed circuit board edge connector, comprising a contact part including a base member of a channel section and double thickness, sides of the channel being extended at one end of the base member to define a pair of resilient, parallel spaced contact arms for receiving between an edge of a printed circuit board, each arm being of double thickness, the thickness of each contact arm being formed at the free end of the contact arm remote from the base member.

3,787,802

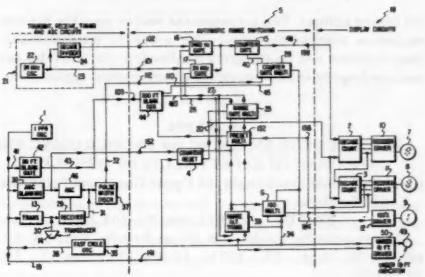
AUTOMATIC RANGE SWITCHING FOR DIGITAL DEPTH SOUNDERS

Rodman S. Brahman, Berrien Springs, Mich., assignor to Heath Company, Benton Harbor, Mich.

Filed May 8, 1972, Ser. No. 250,921

Int. Cl. G01s *9/68*; G04f *9/00*

U.S. Cl. 340—3 R **5 Claims**



A depth sounder instrument having automatic range switching in which an oscillator and a divider produce timing pulse trains at two different frequencies which are related to the propagation velocity of the depth sounder transmitted pulse. A selected one of the pulse trains is delivered to a digital counter during the interval between the transmitted energy pulse and the received pulse, the latter having been reflected from the bottom of the body of water. The apparatus includes logic means responsive to the count arrived at during this interval to select the total instrument range for the next interval, this range being chosen by the selection of the pulse train. If the count accumulated during the interval is appropriate to the previously selected range, no change is made. However, if the count is either much smaller than, or greater than, the counter capacity, the other frequency is chosen, thereby causing the counters to accumulate at a faster or slower rate. The frequencies are preferably related by a power of 10 and a decimal point can then be illuminated or not, depending upon the range and frequency chosen.

3,787,803

HIGH PERFORMANCE METER DEPTH SOUNDER FOR AUTOMATICALLY INDICATING DEPTH WITHOUT MANUAL ADJUSTMENT

John N. Beebe, Londonderry, N.H., assignor to Raytheon Company, Lexington, Mass.

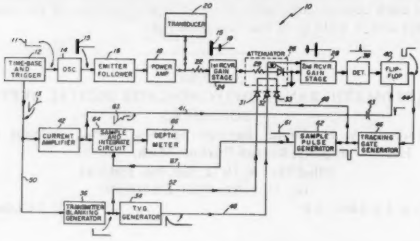
Filed Nov. 29, 1972, Ser. No. 310,300

Int. Cl. G01s *9/68*

U.S. Cl. 340—3 R **15 Claims**

A depth meter circuit which overcomes the usual necessity for manual adjustment of the sensitivity control to improve the signal-to-noise ratio and to prevent spurious meter response to wakes and debris at intermediate depths is achieved by a dynamically adjusted receiver attenuator circuit which is controlled by the combination of an automatic bottom tracking gate, a time varied sensitivity circuit and a transmission blank-

ing circuit operating in conjunction with a meter indicating circuit which is activated only during the time of return echoes by means of a ramp voltage sampling circuit actuated only by



the return echoes. The arrangement makes possible the use of maximum transmitted power for accurate measurement of deep bottoms and on the same nonlinear scale, provides accurate readings of shallow depths without manual adjustment.

3,787,804

APPARATUS FOR ENSURING OR ENCOURAGING THE WEARING OF SAFETY BELTS IN VEHICLES

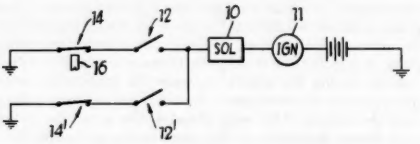
Kenneth Donald MacDonald, 16 Upper Garrabost Poini, Isle of Lewis, Scotland

Filed Dec. 15, 1971, Ser. No. 208,265

Claims priority, application Great Britain, Dec. 18, 1970, 60,290/70; Apr. 23, 1971, 11,036/71; June 2, 1971, 18,657/71

Int. Cl. B60g *9/00*; **B60r** *21/10*

U.S. Cl. 340—52 E **10 Claims**



The invention provides a warning device which is operable by a driver or any of his passengers in a vehicle failing to fasten their safety belts, to limit the throttle opening of the vehicle engine to a predetermined maximum, which may be zero i.e. the idling condition. There is further provided a system in which the warning device is rendered inoperative by means of a switch associated with the driver's seat and so arranged that when the driver assumes an abnormal seating position on the seat this switch renders the warning device inoperative. There is also provided a system in which a further switch is associated with a safety belt, which further switch is sensitive to whether or not at least part of that safety belt is approximately in a predetermined position, whereby if a user is not wearing the belt in a normal position the switch will operate the warning device.

3,787,805

MECHANICAL EMERGENCY CENTRAL SWITCH ASSEMBLY FOR MOTOR VEHICLE

Hendrik Johannes Van Jaarsveldt Combrinck, Stand 44, Comptonville, Johannesburg, South Africa

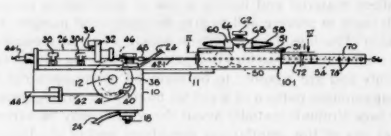
Filed Aug. 15, 1972, Ser. No. 280,749

Claims priority, application South Africa, Aug. 17, 1972, 5489

Int. Cl. H01h *35/02*

U.S. Cl. 340—52 H **4 Claims**

The invention is directed to the complete electrical disconnection of the battery of a motor vehicle by automatic or manual control devices to prevent a fire to be started in the event of an accident or when the vehicle is left unattended, while resetting of the automatic means and reconnection of the battery is by another manual control. The automatic con-



trol comprises a resiliently held and spring biassed mass which, when freed, opens at least one switch connected in a conductor leading from one of the terminals of the battery. The resetting manual control is preferably lockable.

3,787,806

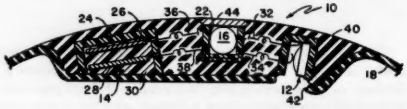
TIRE PRESSURE WARNING APPARATUS

Donald E. Church, Richmond, Ind., assignor to Avco Corporation, Richmond, Ind.

Filed June 26, 1972, Ser. No. 266,113

Int. Cl. B60c *23/04*

U.S. Cl. 340—58 **4 Claims**



A tire pressure warning apparatus for operation in a pneumatic tire in combination with an inner tube is disclosed. The warning apparatus comprises a pressure sensor, transmitter and a source of power sealingly adhered to an inner tube. The sensor assembly being in communication with the tire pressure for actuation of the transmitter in response to a drop in the tire pressure. Means are provided to protect the individual components while permitting the necessary flexibility to conform to the shape and motion of the inner surface of the tire.

3,787,807

MOUNTING FOR A SPEED DETECTOR

Giovanni Anselmino, and Emanuele Ravizza, both of Turin, Italy, assignors to FIAT Societa per Azioni, Turin, Italy

Filed July 12, 1972, Ser. No. 273,012

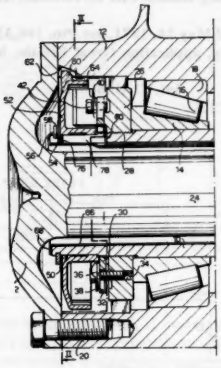
Claims priority, application Italy, July 20, 1971, 69436 A/71

Int. Cl. B60q *9/00*

U.S. Cl. 340—62 **2 Claims**

An assembly for mounting a detector sensitive to the speed of rotation and angular position of a wheel and which allows the detector to be readily accessible for maintenance is disclosed. In addition the detector is spaced from the brakes of the wheel so that it is protected from the heating effect of the brakes which might affect its performance. The detector comprises a phonic wheel which is mounted for rotation about a hollow boss on which the wheel is rotatably mounted and through which passes the half-shaft from the differential, and a magnetic sensor which is secured to the boss. The magnetic

sensor has an output lead which is guided by a groove formed by the co-operating longitudinal edges of a metal plate formed



into a tube and located on the inside of the hollow boss in such a way that the half-shaft which passes therethrough also passes through the tube.

3,787,808

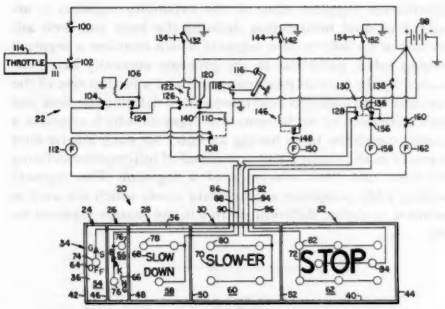
AUTOMOBILE SIGNALLING SYSTEM

Kenneth K. Knopf, 850 Chiltron Rd., Hillsborough, Calif.

Continuation of Ser. No. 883,848, Dec. 10, 1969, abandoned. This application Mar. 2, 1972, Ser. No. 231,432

Int. Cl. B60q 1/44

U.S. Cl. 340—66 **4 Claims**



A signalling system for automobiles to visually warn following motorists of deceleration stages. A series of panels mounted on the rear of the automobile are illuminated by a control circuit in a predetermined program responsive to both throttling and braking operations. The control circuit is effective to actuate the panels throughout vehicle deceleration in a manner which generates signals proportioned in size, color, and intensity to the rate of change of deceleration. In one form, the circuit senses daylight intensity conditions to increase panel illumination for added signal contrast and effectiveness. In another form, the control circuit illuminates an additional information containing panel for a given time length following a deceleration stage.

3,787,809

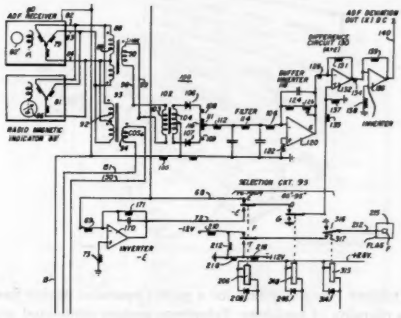
SYSTEM FOR DERIVING AZIMUTH STEERING COMMANDS FROM AUTOMATIC DIRECTION FINDING EQUIPMENT

Philip G. Cooper, Saratoga, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Oakland, Calif.

Filed Sept. 22, 1971, Ser. No. 182,735

Int. Cl. G01s 3/42

U.S. Cl. 343—117 R **18 Claims**



An airborne navigation system for deriving azimuth steering commands from automatic direction finding equipment which includes a receiver for selecting a commercial broadcast station, a selector dial for selecting a desired course or azimuth to such broadcast station, and circuitry for providing a left-right deviation signal which enables the pilot to fly the aircraft along the selected course line (azimuth). Associated circuitry provides signals which indicate whether the aircraft is approaching toward or departing from a station, whether the aircraft is over the selected broadcast station, and whether the selected broadcast station has a predetermined relative bearing, which signals are used to provide a more reliable display of azimuth steering commands.

3,787,810

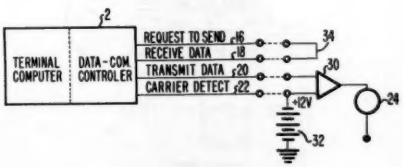
TEST METHOD FOR A PROGRAMMABLE DATA COMMUNICATION TERMINAL

Gerald N. Wiggins, Pinckney, and Jerome S. Rogers, Livonia, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 2, 1972, Ser. No. 303,129

Int. Cl. G08c 25/00; G05b 23/02

U.S. Cl. 340—146.1 E **11 Claims**



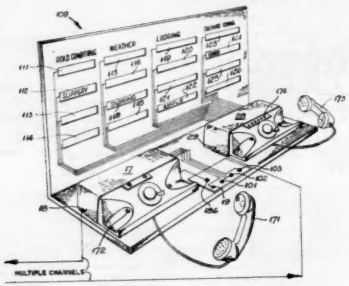
A method of testing the transmit and receive functions of a programmable data communications terminal. The transmit function is tested by having a program within the terminal computer continually transmit a known bit pattern and measuring the voltage output of the transmit line. The receive function is tested by connecting the request to send line to the receive data line and programmably generating a character on the request to send line that may be read via the receive data line.

3,787,811

REMOTE CONTROL SYSTEM

James R. Hilgedick, Oakland, Calif., assignor to Lloyd Bowen, Oakland, Calif.

Filed Feb. 3, 1971, Ser. No. 112,123
Int. Cl. H04m 11/00
U.S. Cl. 340—163 R 6 Claims



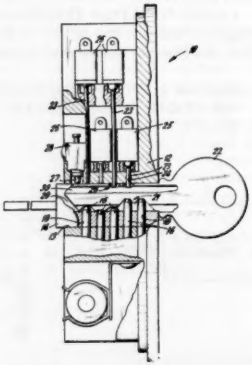
A remote control system for a power operated device having a plurality of positions. Telephone system connected and receiving apparatus at an attended station is combined with telephone system connected receiving and transmitting apparatus at the remote station for enabling an operator at the attended station to advance the device to any of its positions and to receive back information from the remote station indicating to the operator the precise extant position of the device.

3,787,812

PICK-PROOF LOCK

William H. Armstrong, Middlebury, Conn., assignor to The Waterbury Pressed Metal Company, Waterbury, Conn.

Filed Oct. 20, 1971, Ser. No. 190,905
Int. Cl. E05b 47/00, 45/10
U.S. Cl. 340—164 R 6 Claims



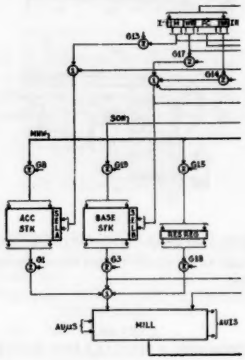
A pick-proof lock for use with a key having a double bitting. First means is included for reading the first bitting. Second means is included for reading the second bitting to open the lock only when the first bitting reading means and second bitting reading means are enabled by a key having the proper bittings. Unlocking preventing means prevents unlocking of the lock until the second bitting reading means is enabled. Responsive means disables the unlocking preventing means when the second bitting reading means is enabled.

3,787,813

DATA PROCESSING DEVICES USING CAPABILITY REGISTERS

Alun John Cole, Broadstone; John Michael Cotton, Windsor, and David Cockburn Cosserat, London, all of England, assignors to Plessey Handel Und Investments A.G., Zug, Switzerland

Filed May 24, 1971, Ser. No. 146,334
Claims priority, application Great Britain, May 26, 1970, 25,245/70
Int. Cl. G06f 9/20
U.S. Cl. 340—172.5 3 Claims



A data processing device, for use in a time-sharing computer system, comprises a central processing unit and a storage unit, the information in the storage unit being arranged in segments and the central processing unit includes a plurality of capability registers each arranged to store descriptor information indicative of the base and limit addresses of an information segment. One of the capability registers is arranged to hold information defining the base and limit addresses of an information segment which contains a segment pointer table, particular to the program currently being executed by the central processing unit and a further one of the registers is arranged to hold information defining the base and limit addresses of an information segment which contains a master capability table having an entry for each information segment in the storage unit composed of information defining the base and limit addresses of a segment. The segment pointer table comprises a list of data words which are used as pointers to define different entries in the master segment table.

3,787,814

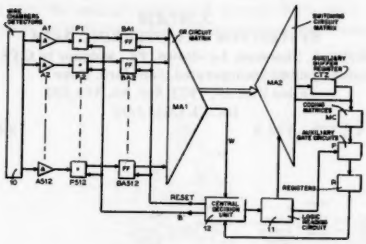
LOGIC SYSTEM FOR THE PROCESSING OF DATA DELIVERED BY NUCLEAR DETECTORS

Roland Pages, New York, N.Y., assignor to Schlumberger Instruments et Systemes, Paris, France

Filed June 22, 1971, Ser. No. 155,548
Claims priority, application France, June 23, 1970, 7023118
Int. Cl. G06f 7/00
U.S. Cl. 340—172.5 12 Claims

A logic system for processing data derived from a multiplicity of individual detectors for the purpose of detecting the presence of data generated by at least one of said detectors and for the purpose of identifying the detectors which have generated data. The disclosed logic system is particularly suited for use with nuclear detectors designed to detect the existence of particles with very short life times which could be of

the order of a nanosecond. The disclosed embodiment comprises a first pyramidal multilevel matrix of OR circuits and a second pyramidal multilevel matrix of switching circuits, with



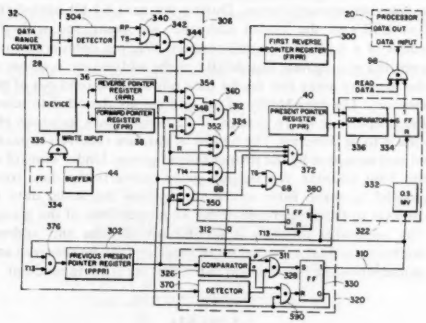
the two matrices being symmetrical, and with the first matrix serving primarily to detect the presence of data generated by a detector and the second matrix serving primarily to identify the detectors which have generated data.

3,787,815

APPARATUS FOR THE DETECTION AND CORRECTION OF ERRORS FOR A ROTATIONAL STORAGE DEVICE

William W. Farr, Jr., Holliston, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed June 24, 1971, Ser. No. 156,260
Int. Cl. G06f *11/04*
U.S. Cl. 340—172.5 **13 Claims**



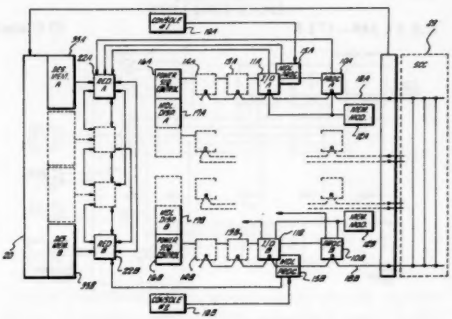
Pages included in a record and stored on a rotational storage device include data, a reverse pointer and a forward pointer, the reverse pointer linking to the previous page and the forward pointer linking to the next page. The reverse pointer of the current page operated on and the address of the previous page addressed are compared generating an error signal if such pointers are dissimilar. In response to the error signal, the page last addressed is readdressed following which the pages of the record are addressed in reverse order until the complete record is transferred to or from the device.

3,787,816

MULTIPROCESSING SYSTEM HAVING MEANS FOR AUTOMATIC RESOURCE MANAGEMENT

Erwin A. Hauck, Arcadia; Don M. Lyle, Huntington Beach, and James E. Wollum, Glendora, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 12, 1972, Ser. No. 252,875
Int. Cl. G06f *11/06*
U.S. Cl. 340—172.5 **10 Claims**



The disclosure relates to a multiprocessing system which may be reconfigured in a controlled manner to redesignate the functions assigned to particular similar units so as to provide continuous data processing capabilities. In certain circumstances, a failed unit or group of such units can be isolated from the system. Whenever a malfunction is sensed which requires corrective measures, the system operation is halted, the different operational units of each of the processing groups which make up the multiprocessing system are redesignated for different functional tasks, a new and reliable copy of the master control program is loaded into main memory and the system operation is reinitiated

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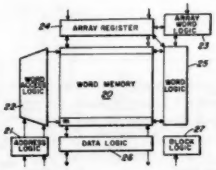
3,787,817

MEMORY AND LOGIC MODULE

Jacob Goldberg, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1972, Ser. No. 265,093
Int. Cl. G11c *11/34*
U.S. Cl. 340—172.5 **5 Claims**



A system for augmenting a computer memory with storage and logic functions so as to provide parallel data processing and serial accessing capability consisting of a hybrid combination of a random-access memory and a cellular logic-in-memory array. The basic module of the system is a monolithic semiconductor array. Various other component parts, such as address logic, data logic and word logic may be included as part of the module.

3,787,818
MULT-PROCESSOR DATA PROCESSING SYSTEM

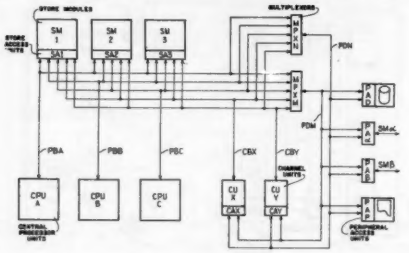
John Spencer Arnold; George Morland Beck; Roger John Boom; David Cockburn Cosserat; Kenneth James Hamer Hodges; Theodor Duncan Sandeman; Roger Morley Williams, all of Ilford, England, and Michael O'Halloran, Mittagong, Australia, assignors to Plessey Handel Und Investments AG, Zug, Switzerland

Filed June 22, 1972, Ser. No. 265,410

Claims priority, application Great Britain, June 24; 1971, 29,670/71

Int. Cl. G06f *15/16*

U.S. Cl. 340—172.5 **17 Claims**



A data processing system includes a group of peripheral units, a plurality of memory modules, a plurality of input-output channel units for use in providing access to the group of peripheral units and a plurality of processor modules. It also includes a plurality of separate data communication paths, one for each processor module and one for each input-output channel unit and each of the data communication paths is separately connected to all the storage modules and to at least one multiplex unit and each of the multiplex units is connected by an individual data transfer path to all the peripheral units of the group and all of the input-output channel units.

3,787,819
DEVICE FOR THE PROCESSING OF DIGITAL SYMBOL DATA FOR THE PURPOSE OF DISPLAYING TEXT ON A TELEVISION MONITOR

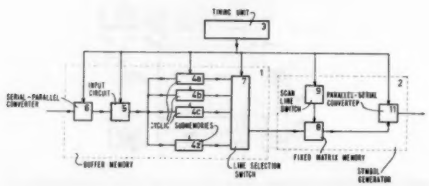
Hendrik Busink, Eibergen, Netherlands, assignor to N.V. Hollandse Signaalapparaten, Hengelo, Netherlands

Filed July 19, 1972, Ser. No. 273,347

Claims priority, application Netherlands, July 23, 1971, 7110158

Int. Cl. G06f *3/14*; G08b *23/00*

U.S. Cl. 340—172.5 **9 Claims**



A computer terminal for the processing of supplied symbol data for the purpose of displaying lines of text on a television monitor. The buffer memory of the computer terminal comprises an input circuit and a plurality of cyclic submemories, where the input circuit provides for the storage of the data required for displaying one line of text in the respective submemory. The number of times this data is fed from the respective submemory to a symbol generator connected to the buffer memory, corresponds to the number of scan lines required for displaying one line of text, the symbol generator feeding the data of a desired scan line each time to said monitor.

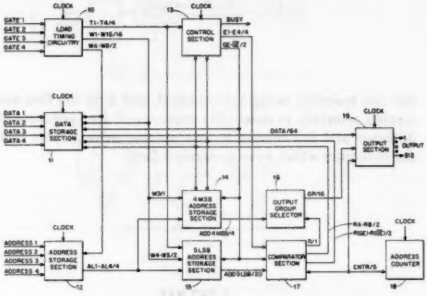
3,787,820
SYSTEM FOR TRANSFERRING DATA

Frederick A. Sherman, Levittown, Pa., assignor to GTE Information Systems Incorporated, Stamford, Conn.

Filed Dec. 29, 1972, Ser. No. 319,507

Int. Cl. G06f *3/00*

U.S. Cl. 340—172.5 **5 Claims**



Apparatus for transferring messages received at any of four inputs to any of 512 outputs. Messages of 64 bits each may be present on any of four data input lines simultaneously. A 9-bit address identifying an output line is provided with each message on an associated address line. The 64 data bits of each message received during a 64-bit message input period are stored in a memory array. The four most significant bits (MSB) of each address are stored in one memory array and the five least significant bits (LSB) of each address are stored in another memory array. During the next 64-bit period the five LSB's of the stored addresses are compared with the count of a 5-bit (32 count) counter. When a comparison occurs, the appropriate four MSB's of the address are read out of the memory array and the 64 data bits are also read out of the memory. The four MSB's of the address are decoded to select the proper one of 16 groups of 32 output lines to which the data is to be directed. The 64 bits of data are received in parallel and accepted by the proper output group. Under control of the 5-bit counter, the output group converts the data from parallel to serial form and demultiplexes the serial data to direct it to the proper one of the 32 output lines of the group. The apparatus includes a second set of data and address memories so that a second set of messages can be received and stored while the information in the first set is being read out.

3,787,821
READ ONLY MEMORY

Billy H. Vinson, San Diego, Calif., assignor to Digital Scientific Corporation

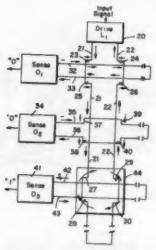
Filed June 21, 1971, Ser. No. 155,201

Int. Cl. G11c *17/00*

U.S. Cl. 340—173 SP **19 Claims**

A high speed semipermanent read only memory is described in which energy is coupled from a first drive line to an orthogonally positioned sense line. In the preferred embodiment, the drive lines are jogged at right angles and the sense lines are caused to cross at right angles to the drive lines and preferrably directly over the right angle jog. The jog is positioned so as to increase the distance between the parallel drive

lines in the area of the crossing between the drive and the sense lines. The action of the jog has the effect of inducing a small voltage in the sense line and having a polarity that is opposite to the polarity of the output voltage in the sense line when a conductive patch is present. In those areas of crossing between the drive lines and the sense lines where a desired output is required, a small conductive nonmagnetic material is placed over the area of crossing. A current in the drive lines will induce an eddy current in the conductive patch which in



turn induces a voltage in the associated sense line which has an opposite polarity to that caused by the jog and which will be called positive.

In the presence of a desired signal such as a "1", a strong positive signal is detected in the sense line and where a "0" output is desired, such as by having no conductive path over the crossing, a small negative signal will be detected thereby allowing a differential amplifier in the sense line to discriminate between "0" and "1" in a manner not heretofore possible.

3,787,822

METHOD OF PROVIDING INTERNAL CONNECTIONS IN A SEMICONDUCTOR DEVICE

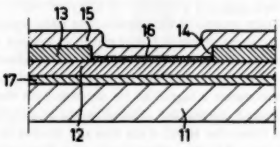
Jean-Pierre Rioult, Epron, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1972, Ser. No. 243,814

Claims priority, application France, Apr. 23, 1971, 71.14550

Int. Cl. G11c *17/00*; H01l *7/02*

U.S. Cl. 340—173 SP **9 Claims**



Method of providing interconnection in a monolithic planar semiconductor device, comprising forming first conductor pattern connected to circuit element, providing apertured insulating layer thereover, providing a dielectric oxide layer at first pattern portion exposed through insulating layer aperture and removed from circuit element, and providing second conductor pattern having portion thereof on dielectric oxide layer, the patterns being electrically connected by applying therebetween potential sufficient to cause electrical breakdown in oxide layer. Also, product made by method.

3,787,823

LIGHT CONTROLLABLE CHARGE TRANSFER DEVICE

Satoshi Negishi, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Saiwai-ku, Kawasaki-shi, Japan

Filed July 17, 1972, Ser. No. 272,721

Claims priority, application Japan, July 30, 1971, 46-56780

Int. Cl. G11c *11/34, 9/00, 11/42*

U.S. Cl. 340—173 LS **7 Claims**

A light controllable charge transfer device wherein one surface of a monolithic semiconductor substrate is coated with a photoelectric conductive layer whose surface is covered with a transparent electrode; a bias voltage is applied across the transparent electrode and the opposite surface of said semiconductor substrate; and control light consisting of holding beams and transferring beams, after being introduced, is moved along the surface of the photoelectric conductive layer through said transparent electrode so as to form depletion layers in the semiconductor substrate for storing charged carriers representing bit information.

3,787,824

HIGH-DENSITY MAGNETIC MEMORY

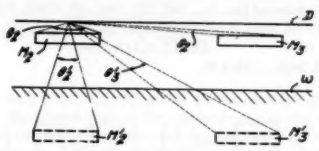
Francis Blanchet, Bresson, and Georges Sauron, Meylan, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Mar. 6, 1972, Ser. No. 232,033

Claims priority, application France, Mar. 4, 1971, 71.07454

Int. Cl. G11c *11/14, 5/02*

U.S. Cl. 340—174 DC **3 Claims**



The memory comprises two orthogonal arrays of conductive elements and magnetic elements and a ground plane, the array of conductive elements being located between the array of magnetic elements and the ground plane at a distance from this latter which is such as to permit writing without any disturbance of information beneath the conductive element, while permitting a high memory-core density and low current consumption.

The method of fabrication of the memory consists in forming a substrate having a flat conductive face, in bonding to said face an insulator having a thickness equal to the distance aforesaid, in coating the insulator with adhesive material, in applying flat, parallel conductive elements on the adhesive material and in depositing parallel magnetic elements on the conductive elements at right angles thereto.

3,787,825

MAGNETIC DOMAIN STORE

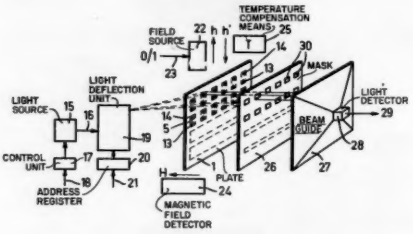
Frederik Ate De Jonge, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 6, 1972, Ser. No. 303,980

Claims priority, application Netherlands, Nov. 12, 1971, 7115628

Int. Cl. G11c 11/14, 11/42

U.S. Cl. 340—174 YC 7 Claims



A magnetic store comprising a plate of magnetic material which has a compensation temperature for magnetization, and in which domains are situated in one of two possible positions of functionally determined bit locations. The displacement of a domain from a first position to a second position, or vice versa, is effected under the influence of a thermal-energy carrying beam, which can be positioned on at least one of the bit locations at a time. When the bit locations are heated, the section of a domain becomes strip-like. During cooling a magnetic field is applied which has a direction such that the relevant domain, assuming its original shape again, will be situated in the desired position of the two possible positions. Detection of the information contents is effected by means of light, which is transmitted through a mask which covers half the area of each bit location. The first and second domain positions are defined by elements of a readily magnetizable material or by an additional plate which is filled with domains.

3,787,826

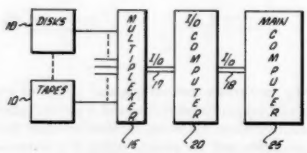
SPLIT-PHASE ADAPTIVE DECODING ELECTRONICS

Kermit A. Norris, Azusa, Calif., assignor to Lockheed Electronics Company, Inc. a subsidiary of Lockheed Aircraft Corporation, Burbank, Calif.

Division of Ser. No. 766,531, Oct. 10, 1968, Pat. No. 3,646,546. This application Sept. 22, 1971, Ser. No. 182,915

Int. Cl. G11b 5/06

U.S. Cl. 340—174.1 H 22 Claims



A decoding system for decoding split-phase signals is disclosed. The system is operative for decoding signals which include extreme zero-crossing variations at either a fixed bit rate or variable bit rates.

A one-bit delay is employed for decoding the split-phase signals. A phase comparison circuit restores the split-phase signal (such as split-phase mark, SØM) to standard digital format, (such as non-return-to-zero-change, NRZC). A digital aperture filter removes noise in the standard format. Delay times are variable via a frequency-located feedback loop so as to accommodate speed variation during fixed or variable data rates. Different data rates are also automatically decoded by the disclosed invention.

3,787,827

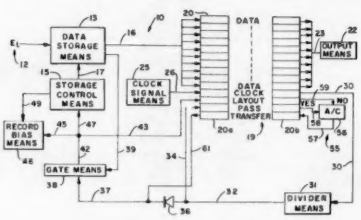
REAL TIME DATA COMPRESSION SYSTEM

Karl J. Stout, Lyndhurst, Ohio, assignor to Ohio Nuclear, Inc., Mentor, Ohio

Division of Ser. No. 168,845, Aug. 4, 1971. This application Oct. 5, 1972, Ser. No. 295,200

Int. Cl. G11b 5/00

U.S. Cl. 340—174.1 P 11 Claims



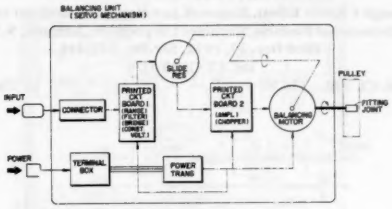
A real time data compression recording system particularly adapted for use in recording randomly-generated analog data. The system preferably comprises an endless loop tape transport system having a plurality of data recording tracks and a plurality of tracks containing information for controlling and monitoring the recording of the data. A clock track contains a recorded clock signal from a signal generator. The clock signal in the readout mode is divided into a lower frequency signal for recording a pass signal on a pass track on the tape to separate the endless tape into a plurality of data spaces. A layout signal on a layout track of the tape indicates whether data has been stored in a corresponding data space. A transfer signal is provided on the transfer track of the tape as a function of the layout signal and the pass signal to control the transfer of data to the tape. Input data are stored in an input data storage means to be read out for recording on the data tracks of the tape upon command from a signal from a storage control means. A gate means in circuit with the storage control means when enabled causes data to be stored on the data tracks when a signal from the data storage means indicates that data are present and available for recording. When data are read out of the input storage means, a signal is recorded on the layout track and the signal in the layout track is used in the readout cycle to prevent recording of additional data in a particular data space on subsequent passes of the tape. Since the pass signal when read out indicates the presence of a data space on the tape and the presence of a layout signal indicates that data has been stored in that space, the pass signal and the layout signal are used in the readout mode to record a transfer signal on the transfer track on the tape. In the readout mode, a signal on the pass track and the absence of a signal on the layout track will cause a signal to be recorded on the transfer track which is used during the record mode to enable data to be transferred from the input data storage means to the data tracks on the tape. On the other hand, if a data space previously had data recorded thereon, the presence of both a pass signal and a layout signal in the readout mode causes the absence of a signal on the transfer track which is used in the record mode in such a manner that even if data are present in the input data storage means for recording, the storage control means will not be enabled during a subsequent pass to record additional data in the occupied data space. The system is described in one embodiment in connection with the recording and display of randomly-generated tomographic data. Thus, randomly-generated data may be compressed in real time for recording in a data storage means, for example, an endless loop tape.

3,787,828

SELF-BALANCING INSTRUMENT

Takefumi Hasebe, and Toshiaki Ando, both of Tokyo, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Apr. 10, 1972, Ser. No. 242,585
Claims priority, application Japan, Oct. 28, 1971, 46-85765; Apr. 14, 1971, 46-27905
Int. Cl. G01d 15/00
U.S. Cl. 340—187 7 Claims



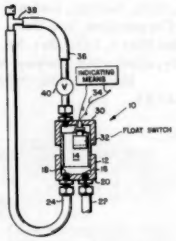
A recording and/or indicating instrument adapted to receive a measured quantity in the form of an electrical signal produced by a primary transducer such as a thermocouple, and to compare such signal with a known standard signal. The deviation between the compared values is amplified to drive a servomotor which alters the standard signal to make it equal to the measurement signal. The value of the standard signal at the balance point is indicated and/or recorded. The servomechanism balance unit, comprising an amplifier, a slide-wire rheostat, is wholly located on a single base plate.

3,787,829

DEPLETED LIQUID SUPPLY INDICATOR

Michael Lawrence Schneier, Pittsford, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed July 3, 1972, Ser. No. 268,716
Int. Cl. G08b 21/00
U.S. Cl. 340—244 A 6 Claims



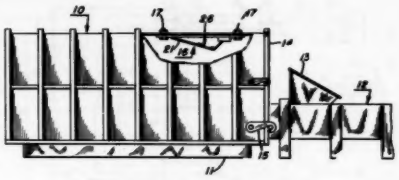
Means for indicating when a liquid supply, such as a drum or like container, is depleted. The means includes a chamber which houses a level indicator, the chamber having an inlet and an outlet. The chamber is arranged so that its inlet communicates adjacent the bottom of the drum. Liquid is then pumped from the drum through this chamber, so as to maintain the chamber filled while the drum is being emptied. When the liquid supply in the drum is sufficiently depleted, continued pumping results in at least partial emptying of the chamber, which in turn activates the level sensor to indicate that the supply has been depleted.

3,787,830

APPARATUS FOR INDICATING WHEN A ROLL-OFF CONTAINER IS FILLED WITH COMPACTED REFUSE

Joseph L. Cato, 1009 Sunset Dr., Brielle, N.J., and Theophilo A. Correia, 271 Pine Ave., Manasquan, N.J.

Filed Apr. 28, 1972, Ser. No. 248,568
Int. Cl. G08b 21/00
U.S. Cl. 340—246 9 Claims



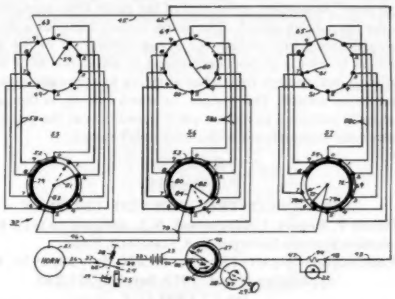
A pressure-actuated device is mounted inside a roll-off container into which bulk refuse is to be compacted. The device is contacted by the compacted material and includes means for effecting operation of signals to indicate when the material in the container is compacted to a predetermined extent.

3,787,831

ALARM SYSTEM

Claude E. Gordon, 4521 Blonigan Ave., Orlando, Fla.

Filed June 19, 1972, Ser. No. 264,034
Int. Cl. G08b 13/22
U.S. Cl. 340—274 8 Claims

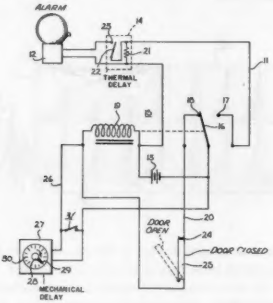


An alarm unit for hotel and motel rooms and the like is mounted on the closed door of the entranceway to the room and has series connected components that include an intruder actuated switch, a DC power source, an audible signaling device and a switching system for disarming the circuit that has an internally located array of switches which are manipulatable to establish a switching combination that can be matched by manipulating the switches of an exteriorly located array in order to gain access to the closed areas without setting off the alarm. The switching system includes parallel branch switching circuits and each circuit includes parallel branch conductors that are connected to one switch in each of the arrays and which are broken in the circuit by manipulating the pair of switches to select the same conductor. The alarm system is housed in a pair of internally and externally located housings and has a self contained power source with connective wiring between the housings extending through a tubular conduit. Provisions are also made for coin actuation and timed use of the unit and the switching arrays permit the occupant to have the sole knowledge of the combination permitting access to the room without energizing the alarm circuit.

3,787,832
TIME DELAY ALARM SYSTEM

William Russell Bolinger, 708 Oak Point, Lake Arrowhead, Calif.

Filed June 11, 1971, Ser. No. 152,229
Int. Cl. G08b *23/00*
U.S. Cl. 340—276 **4 Claims**

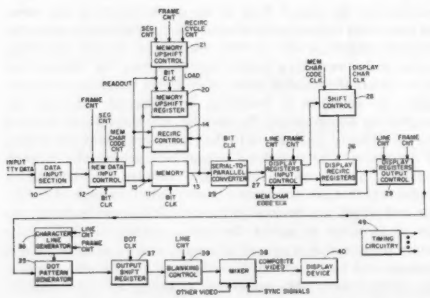


A burglar alarm system is disclosed wherein control means for temporarily deactivating a burglar alarm is located within the building being protected. The control means includes a time delay switch in a deactivating circuit which when manually closed operates to temporarily override a primary circuit which when opened results in the setting off of the alarm. Thus when an authorized person is ready to exit through a door of the building, he first manually closes the time delay switch before opening the door. Then upon the closing of the door, the system is automatically returned to its "on alert" condition at the end of the delay time manually set in the time delay switch. The alarm circuit includes a thermal delay device which delays the actual setting off of the alarm such as to give a person authorized to enter the door of the building just enough time after entering to manually close the time delay switch. The system, as when exiting, is then automatically returned to its "on alert" condition at the end of the delay time manually set in the time delay switch.

3,787,833
UPSHIFT CONTROL FOR VIDEO DISPLAY

William P. Rogers, Collingswood, N.J., assignor to GTE Information Systems Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 58,030, July 24, 1970. This application May 4, 1973, Ser. No. 357,248
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 AD **8 Claims**

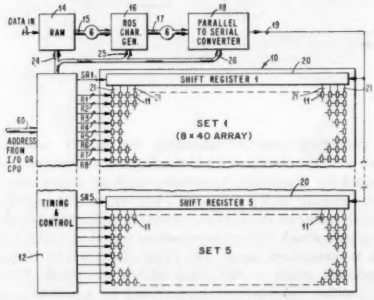


A video display system in which information from a teletype line is displayed in rows on the face of a video display device with new information first appearing on the bottom row, continually being upshifted row by row to the top row, and then disappearing. Information is continually advanced in a recirculating delay line memory by an upshifting arrangement coupled between the output and the input of the memory. Information is taken from the memory as it advances therethrough and is held in display registers from which it is read out at successively earlier times during succeeding frames.

3,787,834
LIQUID CRYSTAL DISPLAY SYSTEM

Joseph Charles Elliott, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,416
Int. Cl. G08b *5/36*
U.S. Cl. 340—324 M **16 Claims**

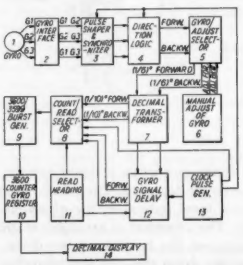


A system for displaying information on a large liquid crystal display unit, for example a 1,600 character unit. The unit is divided into separately addressed matrices of characters. A particular row in each matrix is addressed on a time-multiplex basis during each display cycle. During the succeeding cycle, the succeeding row in each matrix is addressed and so on. The multiplexing sequence uses the slow excitation time and slower de-excitation time of the liquid crystal element to advantage.

3,787,835
CONVERTER FOR GYRO-COMPASS DIGITAL DISPLAY

Odd Mathiesen, Oslo, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 5, 1972, Ser. No. 250,517
Claims priority, application Norway, May 7, 1971, 1731/71
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 SY **3 Claims**



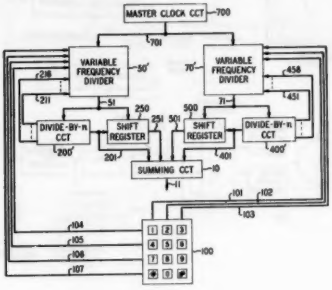
A gyro-compass (synchro) analog output data encoder system for open-loop control of a digital bearing angle indicator in degrees and decimal parts of degrees. Applicable, in general, to digital presentation of shaft angle changes at a remote location.

3,787,836

MULTITONE TELEPHONE DIALING CIRCUIT EMPLOYING DIGITAL-TO-ANALOG TONE SYNTHESIS

David William Hagelbarger, Morris Twp., Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkely Heights, N.J.

Filed June 15, 1972, Ser. No. 263,215
Int. Cl. H03k 13/02
U.S. Cl. 340—347 DA 5 Claims



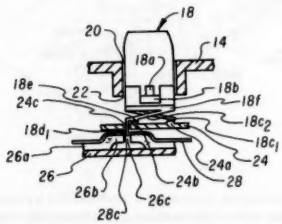
A circuit is provided for generating combinations of digitally synthesized sinusoidal waveforms used for voiceband signaling in multitone telephone station sets. The circuit features plural variable frequency dividers which function under the control of the station set keyboard to divide a single digital master clock signal into predetermined sequences of multifrequency digital components which are shifted in phase predetermined amounts. The shifted sequences of components are summed in suitable proportions to form acceptable approximations of the multitone dialing waveforms.

3,787,837

MODULAR OPTICAL APPARATUS

Charles A. Allen; Richard W. Bryant, both of Poughkeepsie; Thomas J. Delaney, Stanfordville; Vir A. Dhaka, Hopewell Junction; Robert M. Meade, Wassaic, and James D. Wharmby, Poughkeepsie, all of N.Y., assignors to Cogar Corporation, Wappinger Falls, N.Y.

Filed Apr. 19, 1971, Ser. No. 135,152
Int. Cl. G06f 3/02
U.S. Cl. 340—365 P 23 Claims



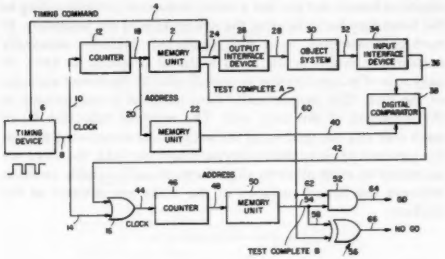
This is modular keyboard utilizing fiber optics for signalling. Each keyboard module includes a common light source for illuminating a group of optical fibers. One optical fiber is provided for each key, and transmission of light by the fiber is permitted only when the corresponding key is depressed, withdrawing a shutter element from a gap in the fiber. The coherent light outputs are furnished to a housing mounted in a ceramic module which couples the light outputs to respective photodetecting elements on a semiconductor chip which is also mounted on the ceramic module. The keyboard modules and individual keys are also replaceable, thus providing low out-of-operation time and character versatility.

3,787,838

FAIL SAFE BUILT-IN TEST EQUIPMENT

Martin W. Feintuch, Baramus, and Allen S. Silver, Oakland, both of N.J., assignors to The Bendix Corportion, Teterboro, N.J.

Filed June 29, 1972, Ser. No. 267,285
Int. Cl. G08b 21/00
U.S. Cl. 340—409 6 Claims



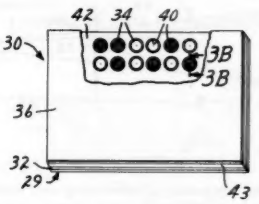
Built-in test equipment (BITE) for an electronic system is implemented in a fail safe manner, with the test equipment itself not having failure modes which might inhibit detection of a system failure. The equipment insures detection of any single system failure and is in a "No-Go" condition if any tests in a test sequence are skipped.

3,787,839

MAGNETIC VIEWER DEVICE HAVING MOVABLE ANISOTROPIC ELEMENTS

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 12, 1970, Ser. No. 88,708The portion of the term of this patent subsequent to June 6, 1989, has been disclaimed.
Int. Cl. G08b 5/22
U.S. Cl. 340—381 R 15 Claims



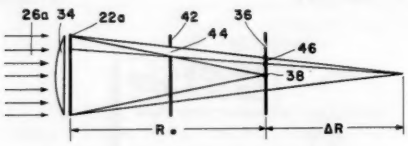
A magnetic data viewer device for providing a visual indication of data encoded in a magnetically encoded document, which data is represented by the magnetic polarity alignments at each of a plurality of disparate magnetized regions defining a fixed two-dimensional pattern. This device is a non-magnetizable board containing a plurality of sockets positioned in a fixed pattern. The sockets each contain a disk containing magnetically hard material which is magnetized to have a given magnetic polarity alignment. At least one broad surface of the disk has a visual indicator for providing an indication of the magnetic polarity alignment of the disk. Each of the disks is visible in its socket, is restrained from movement within its socket by only the dimensions of the socket, and is movable within its socket to assume an orientation corresponding to the magnetic polarity alignment at a said magnetized region. In one preferred embodiment, the magnetically hard material of each disk is magnetized to provide a polarity alignment wherein the opposite broad surfaces of each disk have op-

posite magnetic polarities; the broad surface of one polarity has a visual indicator of a first color and the broad surface of the opposite polarity has a visual indicator of a second color; and each disk is movable to assume any orientation within its socket. In another preferred embodiment, the manetically hard material is magnetized to provide a polarity alignment wherein one broad surface has a pair of magnetized sections of opposite polarities having a boundary therebetween, and the opposite broad surface has a visual indicator corresponding to the boundary for indicating the orientation of the boundary. In both embodiments, each disk preferably includes uniaxially anisotropic magnetically hard material oriented to have an easy axis of magnetization perpendicular to the broad surfaces of the disk. The magnetically hard material is magnetized in the direction of this easy axis. The residual induction B_r of each disk and the spacing of the sockets are so selected that, in the absence of an applied external magnetic field, the disks are attracted by each other to align themselves in a stable position wherein the broad surfaces of the disks are skewed in the sockets.

ERRATUM

For Class 340—172.5 see:
Patent No. 3,787,891

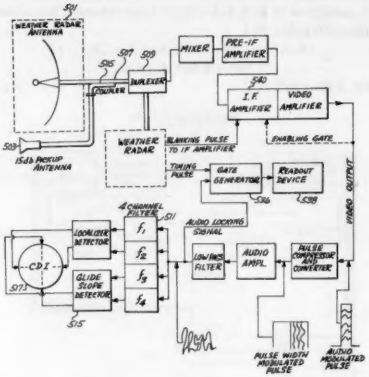
3,787,840
RADAR MOVING TARGET PROCESSING METHOD AND APPARATUS
Charles R. Dotson, Litchfield Park, Ariz., assignor to Goodyear Aerospace Corporation, Akron, Ohio
Filed Apr. 17, 1972, Ser. No. 244,365
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 **3 Claims**



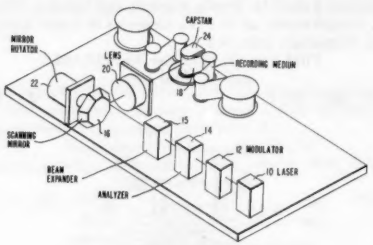
A method and apparatus of processing side looking radar data to detect moving targets in a high clutter environment independent of the direction of the motion of the target. The radar phase history generated by a synthetic aperture radar system is processed in a radar optical correlator which has a scanning aperture placed at the azimuth transform plane. The amount of movement of the image of the viewing plane of the correlator as the scanning aperture moves is directly proportional to the movement of the target.

3,787,841
AIRBORNE RADAR INSTRUMENT LANDING SYSTEM
Walter E. Buehler, Issaquah, and Clarence D. Lunden, Tacoma, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Dec. 21, 1971, Ser. No. 210,448
Int. Cl. G01s 9/06
U.S. Cl. 343—5 LS **10 Claims**

An ILS (instrument landing system) utilizing a modified weather radar system of the aircraft and a retrodirective antenna located at the touchdown point and modulated so as to generate conventional guidance commands (fly up/fly down and fly right/fly left) signals from signal processing of the video output of the weather radar aboard the aircraft. Main pulse blanking of the receiver to avoid saturation during video signal processing of close in guidance commands are applied, e.g., to the fourth I.F. stage.



3,787,842
COHERENT OPTICAL RADAR PROCESSOR
Carlton E. Thomas, Van Nuys, Calif., assignor to KMS Industries, Inc., Ann Arbor, Mich.
Filed May 25, 1970, Ser. No. 40,265
Int. Cl. G01s 9/42
U.S. Cl. 343—5 PC **13 Claims**

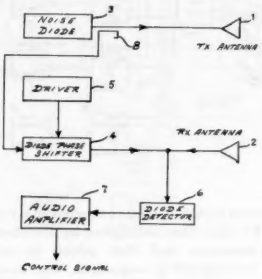


A radar processing system and method for extracting from received radar data information about moving targets even though the absolute energy reflected by these targets is much less than the energy reflected by the stationary background. The processing system includes an optical recorder for recording the magnitude of the reflected energy and a coherent optical processor for processing the recorded information by computing the power spectrum of the Doppler frequency shift in the recorded information and thereby distinguishing a true target from the stationary background. In addition, means are provided for eliminating from the recorded information any range ambiguities produced at higher pulse repetition frequencies because, at these higher frequencies, echoes from far ranges return at the same time as echoes generated by later radar pulses return from near ranges. The optical processor can operate on data from airborne or groundbased radars.

3,787,843
RADAR FENCE SYSTEM

Joseph L. Poirier, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 11, 1972, Ser. No. 314,054
Int. Cl. G01s 9/02; G08b 13/22
U.S. Cl. 343—5 PD **4 Claims**

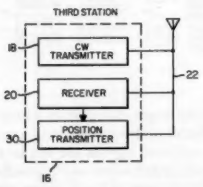


A radar fence system which distinguishes the location of a target of interest to be inside or outside of a predetermined distance (range fence). A noise signal is transmitted toward the target of interest. A portion of the transmitted signal is phase shifted periodically a predetermined amount and then mixed with a received target return signal to provide a resultant signal. It is required that the transmitted signal and received signal be separated. Only if the target of interest is within the range fence will the resultant signal be modulated.

3,787,844
RADIO NAVIGATION SYSTEM

Charles E. Hastings, Newport News; William A. Rounion, Tabb; Allen L. Comstock, Newport News, and Joseph T. Bradbury, Virginia Beach, all of Va., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed May 8, 1972, Ser. No. 251,470
Int. Cl. G01s 9/02
U.S. Cl. 343—6 R **7 Claims**

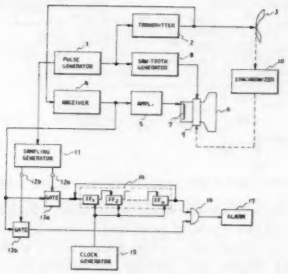


An improved iso-phase line-of-position navigation system for determining the position of a mobile station is disclosed which includes first and second transmitting base stations at respectively fixed locations and a third transmitting station positioned at a movable location. A mobile station is disclosed which includes a receiver for receiving signals from the two base stations and from the third station and means responsive to the signals received at the receiver for determining the position of the mobile station along first and second iso-phase lines-of-position relative to the first and second base stations and the third station. Computing means are provided which are responsive to the position of the mobile station relative to the first and second base stations and the third station and also to the absolute location of the third station for computing the position of the mobile station.

3,787,845
COLLISION ALARMING SYSTEM

Hiroshi Kubota, Takarazuka, and Tomohiko Suzuki, Kobe, both of Japan, assignors to Furuno Electric Company, Limited, Nagasaki-ken, Japan

Filed Oct. 17, 1972, Ser. No. 298,398
Int. Cl. G01s 9/02
U.S. Cl. 343—7 ED **6 Claims**

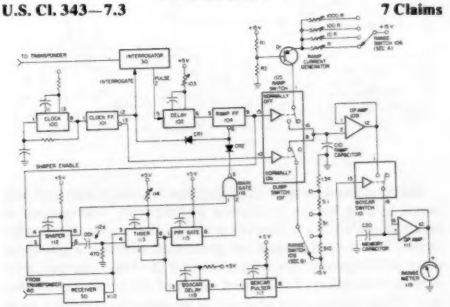


A collision alarm system for detecting the course of an object and producing an alarm should its course indicate the possibility of a collision with the vehicle carrying the system. It includes a transmitter for transmitting pulses and a receiver for receiving reflected pulses. The reflected pulses are detected at at least two successive points in time with the information first detected being stored and then fed out at a predetermined later time related to the sweep rate of the transmitted pulses. The fed out pulses and the pulses detected at the second time point are compared and an alarm is sounded when a coincidence is detected.

3,787,846
CLOSE-IN RANGER SYSTEM

Wilson P. Bishop, Ednor, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 10, 1972, Ser. No. 279,551
Int. Cl. G01s 9/14
U.S. Cl. 343—7.3 **7 Claims**

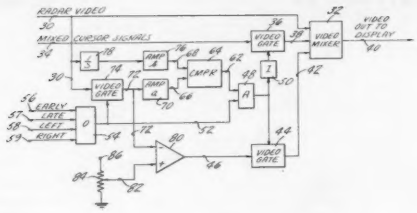


A range measuring system wherein a transponder at a remote location is interrogated by coded signals from a base location. If the interrogation is correctly coded the transponder replies. Receipt of a correct reply interrupts the generation of a ramp voltage at the base location. The ramp voltage is measured to determine the range from the base to the transponder. Novel circuitry including a ramp current generator, selectively variable impedance input range switch means, a selectively variable initial voltage ramp set range switch means, shaper gate means and a timer with pulse repetition frequency gate means, is provided to obtain superior accuracy in range measurements.

3,787,847
INTENSITY CURSOR FOR RADAR

Paul M. Danzer, 2 Dawn Rd., Norwalk, Conn.

Filed Feb. 9, 1973, Ser. No. 330,918
Int. Cl. G01s 7/22
U.S. Cl. 343—7.3 **4 Claims**

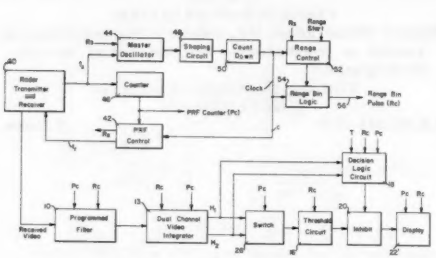


A radar, such as a track-while-scan radar, which is provided with early and late tracking gates interconnected with cursors, blanks out the electronic cursors presentation within the gate region of the display and, instead, modulates the intensity of targets within the tracking gates so that the more closely the cursors are positioned on the center of the target, the higher the intensity of the video in the vicinity of the cursors.

3,787,848
SYSTEM FOR DISCRIMINATING BETWEEN HIGH AND LOW SPEED TARGETS

Terrence H. Laundry, Culver City; Richard L. Luther, Thousand Oaks, and John S. Murray, Jr., Orinda, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 28, 1972, Ser. No. 285,284
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 **16 Claims**



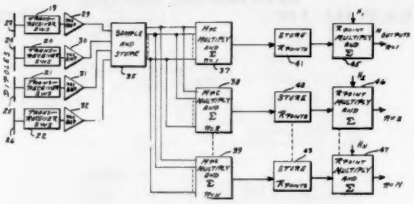
The disclosed system distinguishes between high and low speed targets by the resolution of frequency ambiguities in return signals from a repetition rate coded transmitted radar signal. The return signals are processed through a passband filter; and logic circuits, which monitor the filter's output, provide an indication of the speed range of the targets as a function of the presence or absence of modulation resulting from the repetition rate coding.

3,787,849
AIRBORNE DIGITAL MOVING TARGET DETECTOR

Carlyle J. Sletten, Acton, and William B. Goggins, Jr., Winchester, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 7, 1972, Ser. No. 304,584
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 **4 Claims**

A digital moving target detector in which the transmitter feeds a Butler matrix connecting a series of antennas. On reception the received signals are fed to a sample and store circuit, fed to a series of scaling multipliers, and then summed in N groups with each group including samples corresponding to range bins. The groups are stored at every pulse and then multiplied with a digital reference waveform and summed.

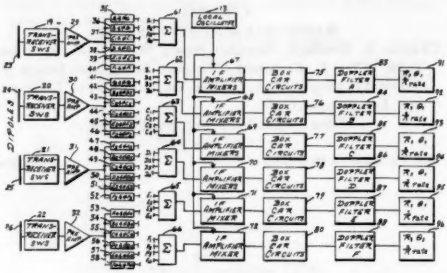


Also the received signals can be converted to a Fourier Transform by an FFT algorithm, multiplied by correlation complex numbers in sequence and then added to corresponding products of corresponding sequences, the inverse Fourier Transform thereof represents radar outputs.

3,787,850
AIRBORNE ANALOG MOVING TARGET DETECTOR

Carlyle J. Sletten, Acton, and William B. Goggins, Jr., Winchester, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 7, 1972, Ser. No. 304,583
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 **2 Claims**



An analog moving target detector in which the transmitter feeds inputs to a Butler matrix connecting a series of antennas. On reception the received signals are fed to a plurality of series of scaling circuits, each series corresponding to one antenna. Corresponding circuits of each series are then summed, fed to intermediate frequency mixers, followed by box car circuits. The output of the box car circuits are fed to selected doppler filters and then to indicators to detect the range, angular position, and range rate.

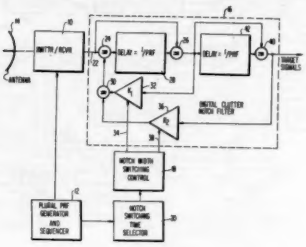
3,787,851
LOW PRF PULSE DOPPLER RADAR HAVING LOW SPEED GROUND MOVING TARGET REJECTION

Robert B. Hughes, College Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 13, 1971, Ser. No. 207,253
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 **11 Claims**

An AMTI radar in which the transmitted pulse train is comprised of multiple PRFs which are sequentially switched in a

predetermined order during a target dwell time. A digital MTI comb or notch filter having a controlled reject and pass band characteristic for each PRF is utilized such that when operating in one of the lower PRFs, a wide notch characteristic is used for a time after radar pulse transmission during the interval which will provide unambiguous range for the highest PRF, i.e. during the interpulse interval of the highest PRF



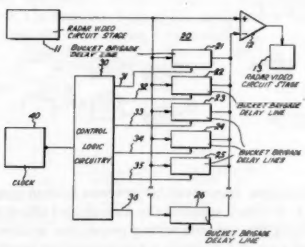
Then a narrower notch characteristic is used for the remainder of the interpulse period of the instant PRF. A composite notch filter characteristic is thus obtained for all of the PRFs during a specific target dwell time which will reject not only ground clutter, but also low speed ground moving targets while passing relatively high speed airborne target returns during at least one of the PRFs.

3,787,852

BUCKET BRIGATE DELAY LINE TIME MULTIPLEXED MTI CIRCUIT FOR RADAR

Charles M. Puckette, Scotia; Donald A. Smith, Schenectady, and Walter J. Butler, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1972, Ser. No. 240,441
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 **10 Claims**



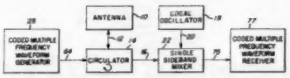
A plurality of bucket brigade delay line circuits are interposed in parallel in a radar receiver signal path. Sequential portions of the received signal are clocked into the bucket brigade delay line circuits serially, so that each radar pulse repetition period is divided into a plurality of subperiods and one such subperiod is stored in each bucket brigade delay line circuit. MTI effect is provided by combining the output of each bucket brigade delay line circuit with the signal in a corresponding subperiod of a preceding or following radar pulse repetition period.

3,787,853

CODED MULTIPLE FREQUENCY SIGNAL SYSTEM

Eli Brookner, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 31, 1967, Ser. No. 628,252
Int. Cl. G01s 9/23
U.S. Cl. 343—8 **6 Claims**



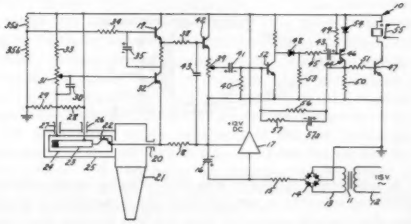
A Doppler radar system comprising a transmitter beaming coded multiple frequency signals and a receiver comprising a plurality of filter means each having a different frequency transfer characteristic and responsive to a different narrow band of echo signals. The simultaneous frequency signals or tones are coded such that the frequency difference between any two frequencies is unequal to the frequency difference between any other two frequencies. The filter means produce a plurality of tones each representing a different Doppler shift. The receiver further comprises a summing network for generating a signal indicative of range and Doppler shift.

3,787,854

NOISE CANCELLING SELF MIXING DOPPLER RADAR

Robert L. Friedman, 51-25 Van Kleeck St., Elmhurst, N.J., and Zeev Lieser, 1048 Coolidge Rd., Elizabeth, N.J.

Filed Aug. 31, 1972, Ser. No. 285,251
Int. Cl. G01s 9/42
U.S. Cl. 343—8 **3 Claims**

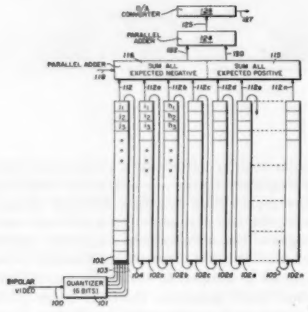


A noise cancelling self-mixing Doppler type microwave motion detector with greater detecting range and/or lower false alarm rate than prior art self-mixing techniques using equal radiated power is described. The device includes a three terminal microwave oscillator/mixer and a wave guide launched dielectric antenna in a single triaxial structure and a dual input signal processor that provides improved signal to noise ratio as a result of effective signal enhancement and noise cancellation. Separate, out of phase, Doppler output signals are derived from both the emitter and the base of the oscillator/mixer transistor and processed by a balanced amplifier which rejects in-phase noise components.

3,787,855
COHERENT DIGITAL RADAR TARGET SIGNAL ENHANCEMENT

Harvey G. Cragon, Dallas, and Russell H. Logan, Irving, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1966, Ser. No. 606,081
Int. Cl. G01s 7/28
U.S. Cl. 343—17.1 R **11 Claims**

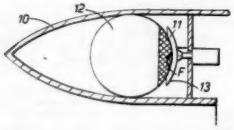


Return signals from successive radar pulses are continuously cross-correlated with a dynamic mask, variations in which are dependent upon velocity and the angle between radar bore site and the main radar beam and wherein a mask is selectively weighted.

3,787,856
SPHERICAL MICROWAVE LENSES

Patrick Frank Pyrah, Knebworth, England, assignor to British Aircraft Corporation Limited, London, England

Filed July 18, 1972, Ser. No. 272,804
Claims priority, application Great Britain, July 26, 1971, 34990/71
Int. Cl. H01q 15/02
U.S. Cl. 343—18 D **6 Claims**



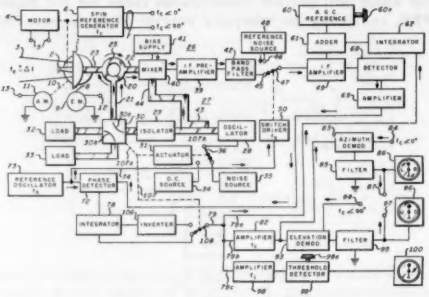
A spherical microwave lens and reflector arrangement in which the reflector is part-spherical and is mounted so as to be movable towards and away from the lens in order that variations in the phase or amplitude of a reflected signal may be produced.

3,787,857
DUAL MODE RADIOMETRIC SYSTEM

Robert E. Lazarchik, Largo; Robert S. Roeder, Dunedin, and Donald R. Runkle, Clearwater, all of Fla., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 18, 1972, Ser. No. 254,707
Int. Cl. G01w 1/00
U.S. Cl. 343—100 ME **10 Claims**

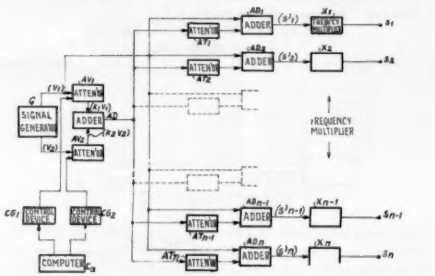
An improved microwave radiometric system features operation selectively in a passive mode and in an active mode providing incoherent noise illumination of a selected target for improving the measured radiometric temperature contrast between the target and its spatial background and for increasing the distance at which such a target may be detected. Broad band noise is continuously transmitted during the active mode and the receiver is continuously active.



3,787,858
ELECTRONIC-SCAN ANTENNA

Jacques Salmon, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sept. 10, 1971, Ser. No. 179,428
Claims priority, application France, Sept. 11, 1970, 7033096
Int. Cl. H01q 3/26
U.S. Cl. 343—100 SA **6 Claims**



In an electronic scan modular antenna system operating at frequency F, a circuit supplies the *n* modules (where *n* is an integer) forming the antenna with *n* respective synchronization signals. The circuit comprises wave generating means supplying two component signals in phase quadrature in respect of each other, of frequency $f=F/p$ (where *p* is an integer), respective means varying respectively the amplitudes of said component signals as functions of the desired direction of radiation of the antenna beam axis, an adder forming the sum of the output signals of the amplitude varying means, *n* respective fixed gain attenuating means for attenuating said sum, *n* adding means for respectively adding the *n* output signals of said *n* attenuating means with one of said components,and multiplying means coupled respectively to the adding means outputs and supplying said synchronization signals.

3,787,859

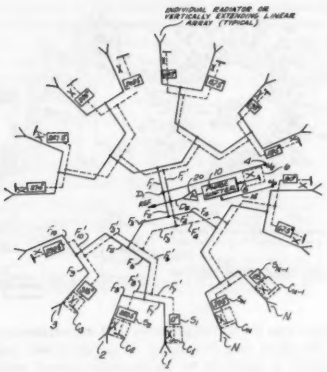
SCANNING CYLINDRICAL ANTENNA FOR A PHASE COMPARISON GUIDANCE SYSTEM

Shirly L. Howard, Rolling Hills Estates, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 29, 1971, Ser. No. 184,880

Int. Cl. G01s 1/44

U.S. Cl. 343—106 R **6 Claims**



A circular or cylindrical scanning antenna array having circumferentially spaced radiating elements fed substantially in phase from a source of a carrier frequency with an imposed reference signal. In addition, an additional energy component is coupled in discretely to each radiating element through a fixed phase shifter for each such element. The fixed phase shifters have values beginning at zero for an arbitrary predetermined element location and then increasing in equal steps of θ where θ is the angular radiating element spacing about the perimeter. The additional energy fed through these phase shifters is modulated by a predetermined modulation signal to produce a single sideband. The result is a scanning, or rotating, amplitude modulated pattern similar to that used in the VOR or TACAN system.

3,787,860

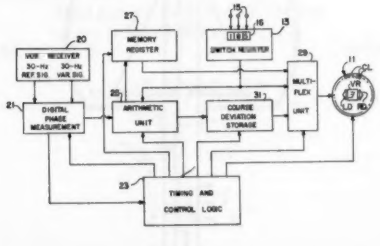
AIRBORNE NAVIGATION APPARATUS

Stanley E. Greatline, Mount Carmel, and Fred Leland Grismore, Carbondale, both of Ill., assignors to Southern Illinois University Foundation, Carbondale, Ill.

Filed Oct. 20, 1971, Ser. No. 190,749

Int. Cl. G01s 1/08

U.S. Cl. 343—106 R **38 Claims**



VOR navigation apparatus is provided with reference and variable phase signals from a received transmission of a VOR station, the phase difference between said signals being proportional to the actual station radial of an aircraft receiving the transmission. The apparatus includes digital phase measurement circuitry for repetitively calculating the digital phase difference between the signals. A solid state display arrangement is responsive to this digital phase difference and has an indicator format which graphically represents the actual radial so as to provide rapid pilot assimilation of aircraft position with respect to the VOR station.

3,787,861

IMPROVEMENTS IN DOPPLER INSTRUMENT LANDING SYSTEMS

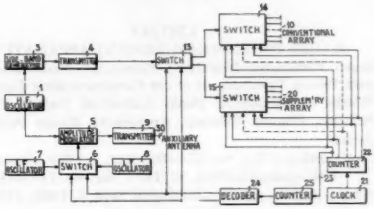
Henri Becavin, and Bruno Letoquart, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 7, 1971, Ser. No. 205,527

Claims priority, application France, Dec. 11, 1970, 70.44760

Int. Cl. G01s 1/38

U.S. Cl. 343—106 D **7 Claims**



A transmitter for a Doppler ILS system comprises two antenna systems operating in a diplex arrangement; the first antenna system is conventional, and is formed by an array of antennas regularly spaced and by an auxiliary antenna, it allows an angle measurement in a comparatively inaccurate fashion; the second antenna system is formed by an array of antennas regularly spaced with a spacing greater than in the first antenna system (the spacing being in either case being measured using as a unit the wavelength corresponding to the operating frequency of the considered antenna array), and by an auxiliary antenna; it would allow an accurate angle measurement were it not for an indetermination; in the Doppler ILS receiver co-operating with this transmitter the choice of the line carrying the information in the spectrum of the low frequency signal derived from the signals received from the second antenna system and permitting an accurate measurement is made by means of the information derived from the signal received from the first antenna system.

3,787,862

RADIO DIRECTION FINDER SYSTEM

Robert S. Jacobson, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

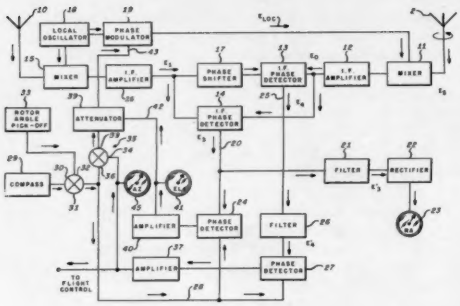
Filed Sept. 27, 1971, Ser. No. 183,934

Int. Cl. G01s 5/02

U.S. Cl. 343—113 DE **30 Claims**

A radio direction finder system incorporating relatively small antennas is provided with a signal processing arrangement for artificially synthesizing variably shaped high frequen-

cy direction finding antenna receptivity patterns useful in a first mode for searching for the general location of a broad-



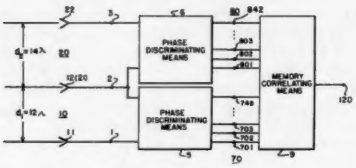
casting high frequency transmitter and in a second mode for precisely tracking such a transmitter for navigation purposes.

3,787,863

RADIO ANGLE MEASUREMENT APPARATUS

Masaru Watanabe; Nobuharu Yamauchi; Naoki Hashimto, and Tetsuo Tamama, all of c/o Communication Equipment Works of Mitsubishi Denki Kabushiki Kaisha, No. 80, Nakano, Minami Shimizu, Amagasaki, Hyogo Prefecture, Japan

Continuation of Ser. No. 854,406, Sept. 2, 1969, abandoned. This application Dec. 30, 1971, Ser. No. 214,495
Claims priority, application Japan, Sept. 5, 1968, 43/63940
Int. Cl. G01s *3/46*
U.S. Cl. 343—113 R **14 Claims**



This invention relates to a radio angle measurement apparatus, which is applicable to radar and other detection systems and which utilizes antenna array system(s) with radiator elements distributed at a spacing larger than one half of the propagation wavelength.

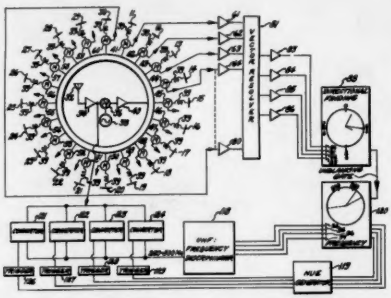
At least two values of d/λ (where d is the said radiator elements spacing, λ the propagation wavelength) are employed. There are, furthermore, a set of phase discriminating means, one for each one d/λ value, for discriminating the phase difference between the signals that are received by neighboring elements of antenna arrays, and a phase-difference-to-angle correlating means for correlating measured sets of said phase differences to the incident angle of the signal, making use of the either theoretically or experimentally known relationships between said sets of phase differences and the incident angle of the signal. In the above correlation process, a consideration of the role played by the resolution of phase discrimination is given, which helps to construct optimal embodiments of the invention, to maximize the possibility of accurate angle measurement.

3,787,864

INSTANTANEOUS SIGNAL RESOLUTION SYSTEM

Arthur L. Blymiller, Rome, and John E. Snodgrass, Oneida, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 12, 1967, Ser. No. 653,307
Int. Cl. G01s *3/14*
U.S. Cl. 343—113 R **4 Claims**



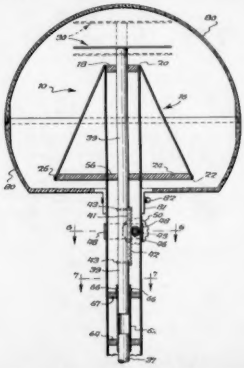
An apparatus for simultaneously and instantaneously determining direction and frequency of an unknown transmitted signal which is received by an omnidirectional antenna and mixed with a local oscillator, the output of which is again mixed in a plurality of mixers each fed by one of a plurality of directional antennas in a circular configuration. The output of the plurality of mixers, being the intermediate frequency, is fed into a vector resolver which controls deflection plates of a CRT and indicates the direction of the signal. The output of the omnidirectional antenna is also fed to a bank of frequency converters, each converter adapted to pass a section of the bandwidth being examined. The bandwidth section having the unknown signal triggers a hue generator controlling a CRT while a frequency discriminator determines the frequency and displays it on a CRT.

3,787,865

DISCONE ANTENNA

Warren L. MacDowell, East Amherst, and William F. Nailos, Snyder, both of N.Y., assignors to Namac Research Laboratories, Inc., Niagara Falls, N.Y.

Filed May 23, 1972, Ser. No. 255,988
Int. Cl. H01Q *13/00*
U.S. Cl. 343—703 **12 Claims**



An antenna comprising a conical element connected at the apex thereof to the outer conductor of an input transmission

line, a disc-shaped antenna element connected to the transmission line inner conductor and positioned adjacent the apex of the conical element, and adjustment means mechanically connected to the line for adjusting the distance between the disc-shaped element and the conical element whereby the impedance match of the antenna to the line can be varied so as to obtain a desired level, preferably a minimum, of the standing wave ratio. The adjustment means can comprise a rack connected to the inner conductor of the line and a pinion engaging the rack whereby rotation of the pinion moves the inner conductor to change the position of the disc-shaped element. A coupling means in the transmission line maintains the electrical transmission path during the relative movement of the conductors. The adjustment means can be automatically operated under control of sensing means connected to the transmission line in response to changes in the standing wave ratio on the line.

3,787,866

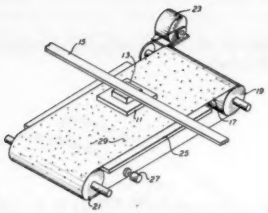
DOPPLER ANTENNA CALIBRATION APPARATUS

George R. Gamertsfelder, Pleasantville; Gus Stavis, Croton-on-Hudson, and Leonard O. Vladimir, Chappaqua, all of N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Dec. 15, 1972, Ser. No. 315,300

Int. Cl. G01s *7/40*

U.S. Cl. 343—703 **10 Claims**



Apparatus which permits near-field calibration of a doppler antenna in the laboratory avoiding the high costs and uncertainties of flight calibration is shown. The antenna and an associated transmitter are mounted over and very close to a scattering surface and means provided to effect relative motion between the antenna and the surface. In one embodiment the scattering surface is on an endless belt which is driven under the antenna and, in another, the antenna is placed on an arm and rotated over an annular trough containing granular material.

3,787,867

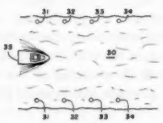
NAVIGATIONAL AID SYSTEM

Robert J. Dodge, and Wilson R. Huffer, both of Houston, Tex., assignors to Automatic Power Division, Pennwalt Corporation, Houston, Tex.

Filed Apr. 12, 1971, Ser. No. 133,190

Int. Cl. G08g *3/00*

U.S. Cl. 343—225 **16 Claims**



A navigational aid system is disclosed in which the operation of a plurality of navigational aid devices is synchronized by a distinctive radiated energy signal received by each of the devices so that the navigational signals emitted by the devices occur either simultaneously or in a predetermined sequence. The distinctive radiated energy signal may be provided by a radio beacon or a signal generated from a transmitter in one of the navigational devices of the system.

3,787,868

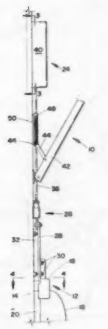
REMOTELY ACTUATED RELEASE APPARATUS FOR SKI BINDINGS

Jerome A. Camp, 7287 S. Chase Way, Littleton, Colo.

Filed June 25, 1971, Ser. No. 156,689

Int. Cl. H04b *7/00*

U.S. Cl. 343—225 R **18 Claims**



The remotely actuated release apparatus for ski bindings comprises a signal transmitter housed in a ski pole which is actuated by the skier to transmit a signal which is intercepted by receivers supported on the skis. The receivers are operatively connected to release the bindings by shifting part of the bindings relative to the boots through a mechanical linkage. In one embodiment, a radio frequency signal is provided and in a second embodiment, an audio (sonic) signal is provided. The release apparatus gives the skier the option of releasing the bindings in addition to the usual force release function built into the bindings.

3,787,869

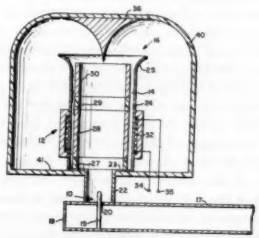
INTEGRATED BEACON ANTENNA POLARIZATION SWITCH

Donald A. Charlton, Huntington Beach, and James S. Ajioka, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 11, 1972, Ser. No. 296,702

Int. Cl. H01q *19/00*

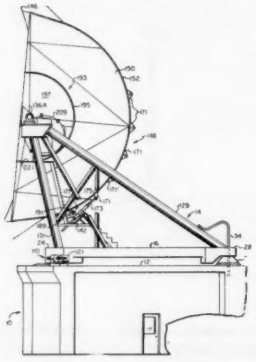
U.S. Cl. 343—756 **10 Claims**



This invention relates to a compact integrated beacon antenna polarization switch which may be designed to be fed by

either coaxial line or circular waveguide and which provides a dual polarization radiating aperture having identical radiation beacon patterns for vertical and horizontal polarization and a ferrite mode switch capable of switching between the vertical, horizontal, right and left circular radiating mode.

3,787,870
LIMITED TRACKING REPOSITIONABLE AZ/EL TURRET TYPE ANTENNA
Salvatore A. Rocci, 1745 Naranca Ave., El Cajon, Calif.
Continuation-in-part of Ser. No. 789,786, Jan. 8, 1969, abandoned. This application Feb. 8, 1971, Ser. No. 113,524
Int. Cl. H01q *3/00*
U.S. Cl. 343—765 **11 Claims**



For tracking missiles, such as communication and navigation missiles, which orbit synchronously with the earth and therefore remain relatively fixed as to aximuth and elevation with respect to a selected point on the earth's surface, adjustments of only a few degrees in azimuth and elevation are usually sufficient to keep an antenna focused on the satellite once the latter has attained a satisfactory orbit. The present invention is directed to a limited tracking antenna for such satellites, and the present disclosure is of a preferred embodiment of the invention. A triangular turret base is pivoted at one apex thereof to swing about an azimuth axis on a flat, horizontal support, structure, and is supported at each of the other apexes for limited slidable movement along a pair of slide plates removably mounted at angularly selected locations on the base. Azimuth control power drive means acts between the turret base and the support structure to control azimuth adjustment of the turret within the limits of movement permitted by the length of the slide plates.

A usual antenna reflector bowl is pivoted on the turret to swing about an elevation axis, and a plurality of attachment means are provided at angularly spaced intervals along a circular mount on the antenna co-axial with the elevation axis.

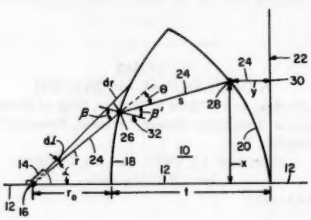
Elevation control means acts between a fixed portion of the turret and a selected one of these attachment means, and controls adjustment of the elevation angle of the antenna within the limits of movement of the elevation control means.

A hemi-cylindrical walkway or work chamber is mounted on the back of the antenna bowl with its axis substantially coincident with the elevation axis. A door is mounted in a circular plate mounted for rotative adjustment over a hole in an end of the walkway to allow positioning the door upright, and a curved step plate is provided to bridge the gap between the door and a platform for safe ingress and exit of workers entering and leaving the chamber regardless of the elevation angle of the antenna bowl.

3,787,871
TERMINATOR FOR SPIRAL ANTENNA
Joe Reese, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Mar. 3, 1971, Ser. No. 121,606
Int. Cl. H01q *1/36*
U.S. Cl. 343—895 **7 Claims**

A spiral antenna wherein its radiating elements terminate in Archimedean spirals.

3,787,872
MICROWAVE LENS ANTENNA AND METHOD OF PRODUCING
James F. Kauffman, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.
Filed Aug. 10, 1971, Ser. No. 170,569
Int. Cl. H01q *15/08*
U.S. Cl. 343—911 **20 Claims**



A microwave lens for use in the transmission of microwave energy, and a method of producing such a lens. The microwave lens of this invention transforms microwave energy passing through the lens to a desired specific phase and amplitude distribution. Both surfaces of the lens are contoured interdependently to provide the desired phase and amplitude distribution.

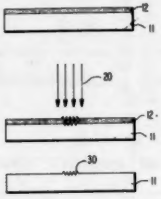
ERRATUM

For Class 343—117 R see:
Patent No. 3,787,809

3,787,873
LASER RECORDING METHOD AND MATERIAL THEREFOR

Masamichi Sato, and Akira Nabara, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 12, 1971, Ser. No. 188,066
Claims priority, application Japan, Oct. 12, 1970, 45-89563
Int. Cl. G01d *15/34*
U.S. Cl. 346—1 6 Claims

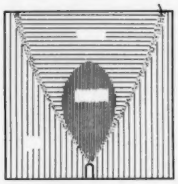


An improved recording method and recording material utilizing a laser beam is disclosed. A transparcnt method is recorded upon with a laser beam of comparatively little energy by providing the material with a light absorbing, deformation promoting, removable layer having a high absorption coefficient.

3,787,874
METHOD FOR MAKING BOUNDARY-LAYER FLOW CONDITIONS VISIBLE

Gerd Urban, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed July 7, 1972, Ser. No. 269,822
Claims priority, application Germany, July 7, 1971, 2133865
Int. Cl. G01d *5/42*
U.S. Cl. 346—1 23 Claims

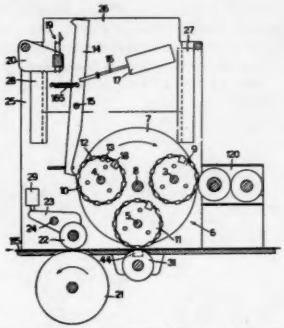


Boundary-layer flow conditions of gases are made visible by applying to the surface of a moving or stationary structural body to be exposed to the flow a reactive layer of at least one chemical color indicator, such as an acid-base indicator and/or a Redox indicator or a liquid-crystal indicator, such as a cholesterinic liquid. Then the body is exposed to a flow of gas, such as air, which gas may contain a reagent. The chemical color indicator can also be applied together with gelling means and a moisture binder. The chemical color indicator can also be absorbed by a high-contrast, absorbent paper which is then applied to the body. A metal or plastic foil coated with a binder and/or indicator can also be used for this purpose. A boundary-layer flow pattern image is produced, which can subsequently be recorded by known means.

3,787,875
MACHINE FOR RECORDING VISUALLY INTERPRETABLE DATA AND MACHINE READABLE INFORMATION ON A TICKET

Walter Gechele, Cascinette, and Bruno Piazza, Ivrea, both of Italy, assignors to Ing. C. Olivetti & Co., S.p.A., Ivrea, Turin, Italy

Filed Nov. 18, 1971, Ser. No. 199,968
Claims priority, application Italy, Nov. 24, 1970, 70917/70
Int. Cl. B41f *17/00*
U.S. Cl. 346—74 MP 6 Claims

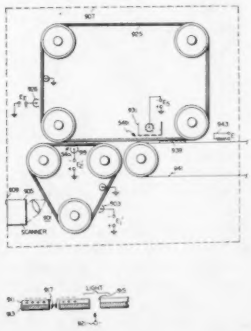


A ticket printing and recording machine prints rows of characters on a first portion of the ticket and magnetically records information corresponding to said characters on a second portion of the ticket. The printing device comprises a plurality of sets of typewheels mounted on a corresponding plurality of common shafts. The shafts are mounted on a support rotatable for causing each set of typewheels to print a corresponding row of characters. The recording device comprises a rotatable magnetic head and is operated in the interval of time comprised between the printing operations of two groups of characters, while the ticket is locked by a flange opposite to the head and by a rod entering a hole of the ticket.

3,787,876
APERTURE CONTROLLED ELECTROSTATIC IMAGE REPRODUCTION

Gerald L. Pressman, San Jose, and Thomas D. Kittredge, South San Francisco, both of Calif., assignors to Electroprint, Inc., Palo Alto, Calif.

Division of Ser. No. 776,146, Nov. 15, 1968, Pat. No. 3,647,291.
This application Jan. 5, 1972, Ser. No. 215,511
Int. Cl. G03g *5/04*, *7/00*
U.S. Cl. 346—74 P 7 Claims



The invention basically comprises apparatus and methods relating to the field of electrostatics, and is concerned with

electrostatic reproducing or constituting. Apertured screen means carry charge distributions in accordance with a pattern such that particles directed at the screen means pass therethrough under modulation control dictated by the pattern.

3,787,877

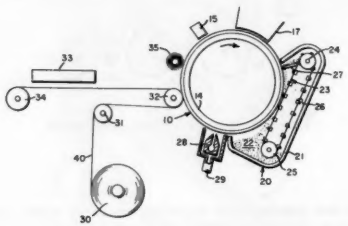
DRY MAGNETIC COPYING PROCESS

George R. Nacci, Wilmington, Del., and Richard C. Toole, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Continuation-in-part of Ser. No. 37,706, May 15, 1970, Pat. No. 3,698,005. This application Apr. 3, 1972, Ser. No. 240,665. The portion of the term of this patent subsequent to Oct. 10, 1989, has been disclaimed.

Int. Cl. G01d *15/12*; **H01v** *3/04*

U.S. Cl. 346—74 MT **14 Claims**



The use of a recording member comprising a transparent support, a stratum of magnetic material and a thin coating of polysilicic acid, in combination with a dry toner powder, preferably one comprising a plurality of toner particles each of which contains at least one ferromagnetic particle, a binder and a cationic surfactant, renders a dry magnetic copying process feasible.

3,787,878

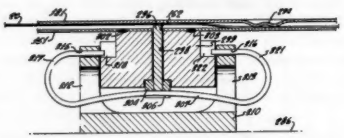
DUAL CHANNEL STRIP CHART RECORDER

Richard S. Kampf, Costa Mesa, and Lisle W. Sultzbaugh, Whittier, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed July 3, 1972, Ser. No. 268,496

Int. Cl. G01d *9/30*

U.S. Cl. 346—49 **12 Claims**



A dual channel strip chart recorder for providing two overlapping traces on a movable chart without time displacement therebetween. One trace is narrow and the other trace is wide to facilitate interpretation of the chart. The recorder utilizes pressure sensitive chart paper which can be written upon from either side and viewed from the front side. The recorder uses one stylus to write on the back of the paper and another opposed stylus to write upon the front of the paper. The styli are driven back and forth across the moving chart by two corresponding movable steel bands, each of which acts as a back-up surface for the opposing stylus. A special styli design is provided to permit stylus crossover without hang-up and to prevent either stylus from punching through the chart paper.

3,787,879

MAGNETIC INK RECORDING SYSTEM

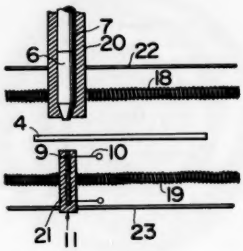
Satoshi Ichioka, and Shinjiro Takeuchi, both of Toda, Japan, assignors to Mishima Kosan Co., Ltd., Kitakyushu-City, Fukuoka Prefecture

Filed May 28, 1971, Ser. No. 148,014

Claims priority, application Japan, Dec. 3, 1970, 45-107017; Dec. 31, 1970, 45-123586

Int. Cl. G01d *15/16*

U.S. Cl. 346—140 **2 Claims**



Recording of magnetic ink on a continuous moving recording paper inserted between magnetic ink supply nozzles and opposed magnetic heads is performed by producing a magnetic field sufficient to attract magnetic ink. Magnetic ink supply nozzles each contain magnetic ink and have a first coil wound thereon to assist the magnetic field and a second coil thereon to oscillate the magnetic ink in the nozzles. Magnetic ink supply means can be a honeycomb mesh and magnetic heads are integrated to produce a dense recording.

3,787,880

INK JET PRINTER INTERCHANGEABLE RECORDING HEAD

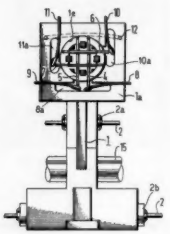
Erich Kattner, and Klaus Bork, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Aug. 15, 1972, Ser. No. 280,821

Claims priority, application Germany, Aug. 24, 1971, 2142409

Int. Cl. G01d *15/18*

U.S. Cl. 346—75 **12 Claims**



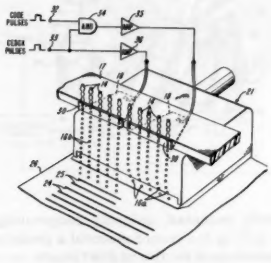
Ink jet printer shiftable along a sheet recorder. The printer has conventional deflection plates or electrodes which, when energized, create an electromagnetic field corresponding to the shape of the indicia to be recorded and cause the spray of ink issuing from the head to be deflected to assume the configuration of the magnetic field. The head is moved along a record sheet traveling about a roll and is connected to its carrier by plug in connections, to enable cleaning or exchanging of the head and to avoid all solder connections. The plug-in connections are so arranged to prevent the plugging forces from being transmitted to the recording head.

3,787,881

APPARATUS AND METHOD FOR BAR CODE PRINTING

Peter Leonard Duffield, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Sept. 18, 1972, Ser. No. 289,772
Int. Cl. G01d *15/18*
U.S. Cl. 346—75 13 Claims



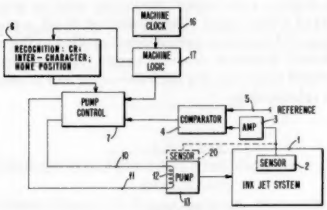
There is disclosed an apparatus and method for controlling a row of ink jet streams to produce printed bars. Ink drops generated by a first group of streams are periodically gang charged and caught under the control of an input clock signal. Those of the drops which are uncharged deposit upon a moving print receiving medium to print a series of regularly spaced bars. A second group of streams within the same row are gang switched and caught under the joint control of the clock signal and a binary code signal. This latter group of streams prints extensions on selected ones of the bars printed by the first group of streams. System operating conditions are adjusted to produce overlapping of the printed dots which collectively define the bars.

3,787,882

SERVO CONTROL OF INK JET PUMP

Gary L. Fillmore; Hugh E. Naylor, III, and Donald L. West, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 25, 1972, Ser. No. 293,300
Int. Cl. G01d *15/18*
U.S. Cl. 346—75 13 Claims



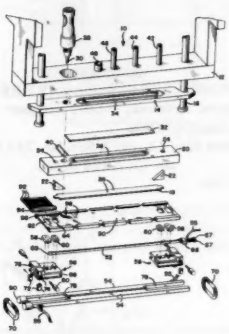
An important factor in quality of printing with an ink jet printing apparatus is the velocity of the ink jet stream. The present case describes a number of servo systems for controlling velocity of the stream. This can be done indirectly by sensing pressure and/or temperature or directly by sensing velocity of the stream and controlling the pump frequency or pump drive currents.

3,787,883

DEFLECTION ELECTRODE ASSEMBLY FOR A JET DROP RECORDER

William Guy Cassill, McArthur, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 20, 1972, Ser. No. 317,074. The portion of the term of this patent subsequent to Oct. 31, 1989, has been disclaimed.
Int. Cl. G01d *15/18*
U.S. Cl. 346—75 8 Claims



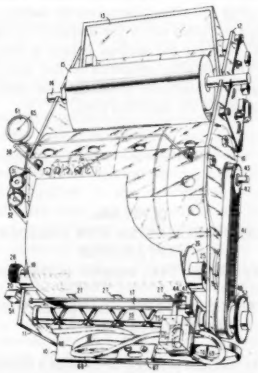
There is disclosed a jet drop recorder which generates and switches two parallel rows of jets. The drops from the two rows of jets are selectively charged by two corresponding rows of charge rings and then pass on opposite sides of an electrically conductive strip which in cooperation with other elements of the generator provides an electrostatic deflecting field to deflect charged drops into one or another of a pair of drop catchers. The electrically conductive strip is relatively thin and is maintained in a straight, non-deformed configuration by taut stretching between the catchers.

3,787,884

INK JET PRINTER

Frederick M. Demer, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 8, 1973, Ser. No. 321,890
Int. Cl. G01d *15/18*; B41j *3/04*; G06k *15/02*
U.S. Cl. 346—75 7 Claims



An ink jet printing system which writes on a record medium by expelling droplets of liquid ink from the cavity of a jet head

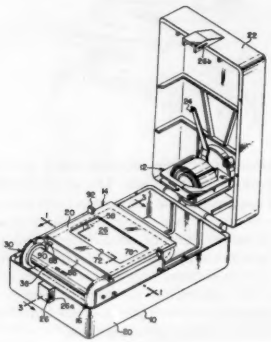
which is reciprocated repetitively along the printing line. A piezoelectric transducer is used to generate ink droplets on demand under control of suitable storage and character generating equipment. Characters are formed by generating dots in a 5×7 matrix as the head traverses back and forth. The record medium is stationary during printing and is advanced one row space at the completion of each horizontal row of dots and also one line space at the completion of each row of characters.

3,787,885

TRANSPORTABLE STRIP CHART RECORDER

Jerry E. Johnson, Bellevue, Wash., assignor to Ryan Instruments, Inc., Seattle, Wash.

Filed May 12, 1972, Ser. No. 252,929
Int. Cl. G01d *15/28*
U.S. Cl. 346—136 **4 Claims**



A readily transportable strip chart recorder includes a disposable strip chart dispenser. The dispenser holds one rolled end of the strip chart and the free end passes over a writing surface and beneath a window exposing the strip chart above the writing surface. The dispenser is detachably mounted in a case with the free end of the strip chart adjacent a drive spool to be wound thereon when in use. The drive spool is powered by a battery driven motor. Two switches are employed to close the circuit between the battery and the motor. One switch is closed when the dispenser is in place in the recorder case, whereas the second switch is closed only after the strip chart is manually advanced on the spool. Battery terminals are exposed externally of the case for checking the battery without opening the recorder case.

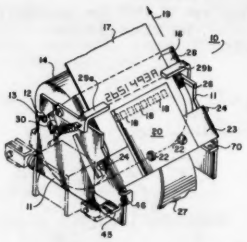
3,787,886

ADVANCING MECHANISM FOR THERMAL PRINT APPARATUS

John McCrady, Dallas, Tex., assignor to Displaytek Corporation, Dallas, Tex.

Filed Jan. 4, 1973, Ser. No. 320,990
Int. Cl. G01d *15/10, 15/28*
U.S. Cl. 346—76 R **20 Claims**

Disclosed is thermal printing apparatus a fixed row of thermal print heads and means for incrementally advancing thermally sensitive paper past and transverse to the thermal print heads for effecting a printout of lines of characters. The advancing mechanism advances the thermal paper while simultaneously releasing the print heads from engagement with the paper, and includes a paper gripping assembly comprising a pair of pivotally mounted, uniquely cooperating, retaining members for pulling the record material a predetermined incremental distance past the row of print heads.

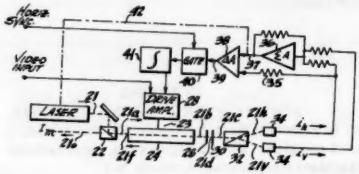


3,787,887

OPTICAL RECORDER WITH INTENSITY CONTROL

Gardner T. Burton, Runnemede, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 769,292, Oct. 21, 1968, abandoned. This application Apr. 29, 1971, Ser. No. 138,768
Int. Cl. G01d *15/14*
U.S. Cl. 346—108 **2 Claims**



Disclosed is a control circuit for establishing a reference level at the output of an optical modulator used to modulate the intensity of a laser beam. The modulated beam is sampled in the presence of a predetermined signal applied to the modulator to detect deviation from a known relationship; and means provided to correct for such deviation and re-establish said known relationship.

3,787,888

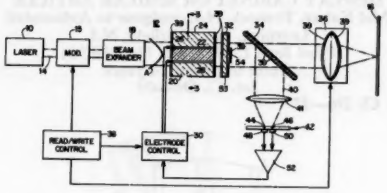
RECORDING APPARATUS WITH BEAM INTENSITY CONTROL MEANS

Haim Haskal, Brookline, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 889,054, Dec. 30, 1969, Pat. No. 3,705,758. This application Oct. 15, 1971, Ser. No. 189,734
Int. Cl. G01d
U.S. Cl. 346—108 **7 Claims**

Focusing means in the path of a beam of coherent electromagnetic waves focus the beam on a focal plane. The beam in-

tensity varies across its diameter. First transparent refractive means in the path of the more intense portion of the beam transmits the waveforms but retards their phase. Second transparent refractive means in the path of the less intense portion of the beam transmits the less intense waveforms but retards their phase an amount different from that of the first refractive means. Interference at the focal plane between the phase changed waveforms alters the original intensity profile of the waveforms. By controlling the relative phase changes the intensity pattern can be altered to be substantially uniform across the beam with only small loss of energy.



3,787,889

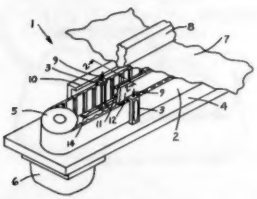
FACSIMILE RECORDER WITH GUIDED STYLI

David Shaler, Madison, and John H. Long, Oakland, both of N.J., assignors to Muirhead, Inc., Mountainside, N.J.

Filed Feb. 5, 1973, Ser. No. 329,575

Int. Cl. G01d *15/24*

U.S. Cl. 346—139 A **6 Claims**



A stylus block for use with a belt-type drive in which guiding means is applied against one side of the stylus block while a resilient guiding force is applied against the other side thereof so that the stylus block is guided in both directions on either side of the scanning line.

3,787,890

STRIKER FOR PRINTING CHRONOCOMPARATOR DIAGRAMS

Jean-Pierre Bonny, La Chaux de Fonds, Switzerland, assignor to Portescap, La Chaux de Fonds, Switzerland

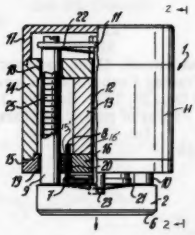
Filed June 14, 1972, Ser. No. 262,609

Claims priority, application Switzerland, June 16, 1971, 8768/71

Int. Cl. G01d *15/24*

U.S. Cl. 346—141 **8 Claims**

A striking device for use in printing diagrams in a chronocomparator includes a striker head and electromagnetic means responsive to electrical control pulses for moving said striker head into contact with a recording or printing web. The electromagnetic means includes a rigid metal frame having a central magnetic core mounted therein and cooperating therewith to define an annular gap in a magnetic circuit. An iron-less coil is movably mounted in this gap and rigidly secured to the striker head. The coil is adapted to be operatively connected to a source of control pulses whereby upon receipt of a control impulse the coil reciprocates in the gap to move the striker head.



3,787,891

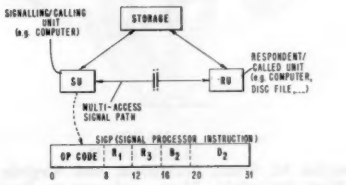
SIGNAL PROCESSOR INSTRUCTION FOR NON-BLOCKING COMMUNICATION BETWEEN DATA PROCESSING UNITS

Brian B. Moore, Wappingers Falls; Andris Padegs, Poughkeepsie, and Ronald M. Smith, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 3, 1972, Ser. No. 268,268

Int. Cl. G06f *1/00*

U.S. Cl. 340—172.5 **17 Claims**



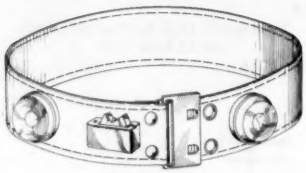
Control initiating instruction SIGNAL PROCESSOR is used to transfer a select control initiating order designated by the instruction from an initiating unit which executes the instruction to a designated respondent unit which interprets the order. If the respondent unit detects an invalid order or other specific exception circumstance it immediately returns indications of specific exception status to the initiating unit. This status is retained in a register specified by the instruction. The entire transaction is completed during the "short" control sequence of execution of the instruction. Hence the participating units and their interconnections are subject to efficient pre-emptive interruption without further delays for "sense" communication of specific exception status. The identity of the respondent unit and an addend factor of the control initiating order are prepared for quick transfer in registers of the initiating unit designated by information in the instruction. The order representation is formed by adding a portion of the immediate instruction and the above addend factor. Optionally contents of another prepared register designated by the instruction information are subject to transfer with the order code as an ancillary output parameter. Another option permits the user to direct the instruction order to itself for diagnostic or other program usage.

DESIGNS

JANUARY 22, 1974

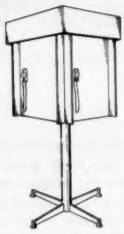
229,989
SHOE
Abe Sedley, Beachwood, Ohio, assignor to International Seaway Trading Corporation, Cleveland, Ohio
Filed Oct. 29, 1971, Ser. No. 194,083
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

229,990
INDICATOR BELT
Sidney Perl, 15510 Hart St., Van Nuys, Calif. 91405
Filed June 5, 1972, Ser. No. 260,050
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—380



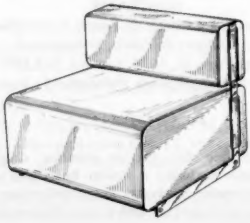
229,991
HAIRBRUSH
Douglas M. Small, Springfield, and Virginia Gosselin, West Springfield, Mass., assignors to Stanley Home Products, Inc., Westfield, Mass.
Filed Jan. 24, 1972, Ser. No. 220,544
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—13

229,992
DISPLAY CABINET OR SIMILAR ARTICLE
Mel Kaiser, Teaneck, N.J., assignor to Automated Learning, Inc., Fairfield, N.J.
Filed June 1, 1972, Ser. No. 258,931
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—27



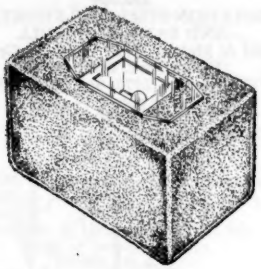
229,993
SEAT OR SIMILAR ARTICLE
Henning Korch, Lugano, Switzerland, assignor to Burris Industries, Incorporated, Lincolnton, N.C.
Filed Jan. 19, 1972, Ser. No. 219,211
Term of patent 7 years
Int. Cl. D6—*02*
U.S. Cl. D6—71

229,994
LOUNGE CHAIR
Richard W. Thompson, Lake Oswego, Oreg., assignor to Litton Business Systems, Inc., New York, N.Y.
Filed June 1, 1972, Ser. No. 258,918
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78

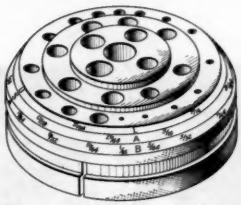


229,995
LOUNGE CHAIR
Oscar Niemeyer, Paris, France, assignor to Mobilier International S.A.
Filed Feb. 22, 1972, Ser. No. 228,428
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78

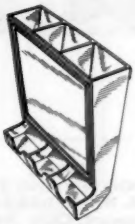
229,996
LAMP-TABLE
Trinie G. Reiter, 3405 Woodbine Ave., Baltimore, Md. 21207
Filed May 18, 1972, Ser. No. 254,830
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



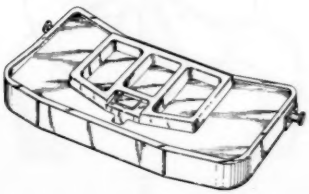
229,997
DRILL HOLDER
John T. Hoffman, 1604 E. Greenleaf St., Allentown, Pa. 18103
Filed Mar. 26, 1973, Ser. No. 345,192
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—188



229,998
DISPLAY RACK
Eugene Kleinman, Montvale, N.J., assignor to Kayser-Roth Corporation, New York, N.Y.
Filed July 27, 1972, Ser. No. 275,856
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—189

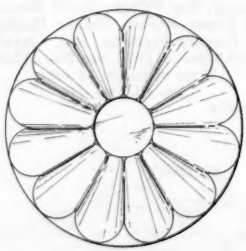


229,999
HIGH CHAIR TRAY WITH REMOVABLE INVERTIBLE INSERT
Lawrence Blazey, Bay Village, David Silverstrom, Lyndhurst, and Elmer Rocker, Shaker Heights, Ohio, assignors to Century Products, Inc., Cleveland, Ohio
Filed Mar. 22, 1972, Ser. No. 237,223
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—199



230,000
SHEET OR SIMILAR ARTICLE OF BED LINEN
Emeric Kanitz, Paris, France, assignor to Cannon Mills Company, Kannapolis, N.C.
Filed May 13, 1971, Ser. No. 143,292
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—264

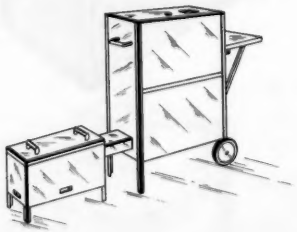
230,001
FOOD SERVING TRAY
June M. Wright, 1000 Judy Lane, Concord, Calif. 94520
Filed July 28, 1972, Ser. No. 276,220
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38



230,002
FISH SCALER
Lonnie G. Albright, Jr., 209 Lake Jeanette Road, Greensboro, N.C. 27405
Filed Mar. 30, 1972, Ser. No. 239,844
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—99

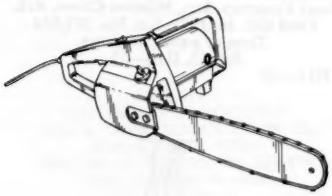
230,003
GOBLET
Maxine G. Levin, Westhill Drive, Gates Mills, Ohio 44040
Filed Dec. 11, 1972, Ser. No. 314,122
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—13

230,004
COMBINATION PORTABLE SMOKEHOUSE AND BAR-B-QUE GRILL
Paul A. Moltere, 2721 Will-o-Th-Green, Winter Park, Fla. 32789
Filed Nov. 24, 1972, Ser. No. 308,982
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—108



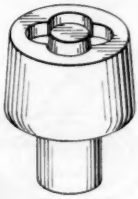
230,005
COMBINED CAN OPENER AND KNIFE SHARPENER
Harold Weiss, Fort Lee, N.J., assignor to Van Wyck International Corporation, New York, N.Y.
Filed June 29, 1972, Ser. No. 267,617
Term of patent 14 years
Int. Cl. D7—*99*; D8—*05*
U.S. Cl. D8—35

230,006
CHAIN SAW
Rodney L. Guthrie, St. Anne, Richard W. Condon, Frankfort, and Roscoe Combs, Jr., Kankakee, Ill., assignors to Roper Corporation, Kankakee, Ill.
Filed May 31, 1972, Ser. No. 258,479
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—65

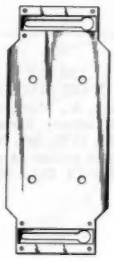


230,007
TAPE CUTTER
John F. Cramer, Shawnee, and James T. Cook, Gardner, Kans., assignors to Cramer Products, Inc., Gardner, Kans.
Filed Apr. 6, 1972, Ser. No. 241,861
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98

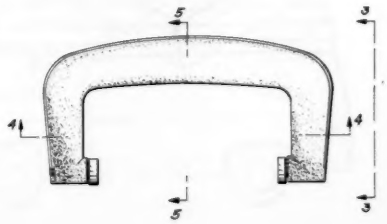
230,008
AUTOMOTIVE VEHICLE WHEEL LOCK
Frederick O. Gibbons, Whittier, Calif., assignor to Orion Industries, Inc., Los Angeles, Calif.
Filed Aug. 14, 1972, Ser. No. 280,711
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—113



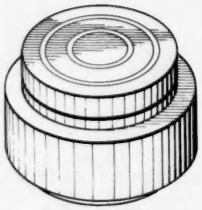
230,009
PLATE FOR CHAIN DOOR LOCKS
Ronald B. Royster, Sr., 1301 South Carolina Ave. SE., Apt. 2, Washington, D.C. 20003
Filed July 3, 1972, Ser. No. 268,615
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—137



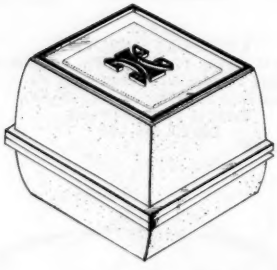
230,010
LUGGAGE HANDLE
Morton H. Baker, Pittsburgh, Pa., assignor to Bruce Plastics, Inc., Pittsburgh, Pa.
Filed June 5, 1972, Ser. No. 260,033
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—154



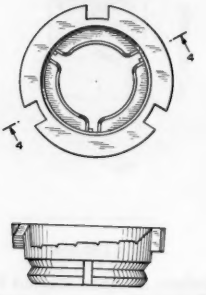
230,011
JAR OR THE LIKE
Elton Cohen Toland, 691 Irola, Los Angeles, Calif. 90005
Filed July 14, 1972, Ser. No. 271,809
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—164



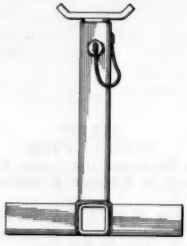
230,012
JEWELRY BOX OR SIMILAR ARTICLE
Richmond L. Chipman, Jr., Montville, N.J., assignor to The Alston Company, Jersey City, N.J.
Filed Feb. 23, 1972, Ser. No. 228,798
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D9—235



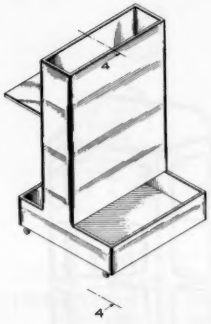
230,013
ADAPTER FOR INSTALLING AN AEROSOL CAN IN A DISPENSING MECHANISM
Richard Emerson, Melville, N.Y., assignor to Auto Comp Devices, Inc., Lynbrook, N.Y.
Filed Apr. 14, 1972, Ser. No. 244,352
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—253

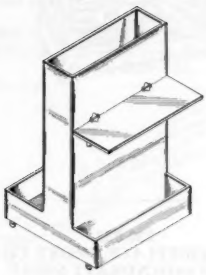


230,014
JACK STAND
George P. Edgell, Sr., Harrison, Ark., assignor to W. J. Stout Company, Inc., Western Grove, Ark.
Filed Oct. 16, 1972, Ser. No. 297,854
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—55

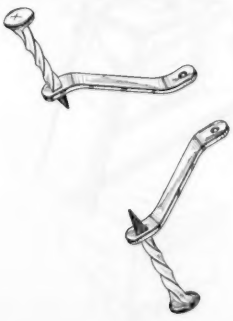


230,015
COMBINED MOBILE LOG CARRIER AND BAR
Milton D. Hatfield, 1204 Roseway SE., Warren, Ohio 44484
Filed Jan. 16, 1973, Ser. No. 324,090
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29





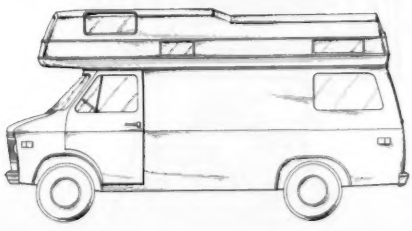
230,016
MOTORCYCLE FOOTPEG
John L. Corey, 21329 S. Martin St., Carson, Calif. 90744
Filed Jan. 2, 1973, Ser. No. 320,078
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



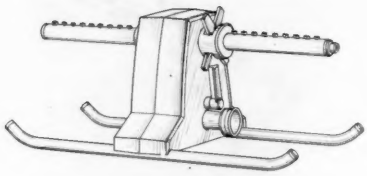
230,017
TRACTION LINK FOR AUTOMOBILE TIRES
Rolf Pfoertner, 2176 E. 29th Ave., Vancouver 12, British Columbia, Canada
Filed Mar. 13, 1972, Ser. No. 234,467
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—154

230,018
MOTORCYCLE LUGGAGE CARRIER
Raymond K. Abrams, Redwood City, Calif., assignor to Motorcraft, Inc., Redwood City, Calif.
Filed July 10, 1972, Ser. No. 270,251
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158

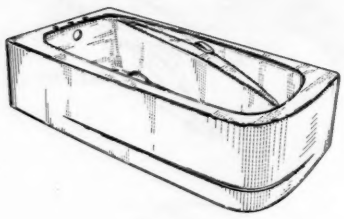
230,019
VAN
Donald H. Cox, Lima, Ohio, assignor to Sheller-Globe Corporation, Toledo, Ohio
Filed Mar. 27, 1972, Ser. No. 238,725
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3 J

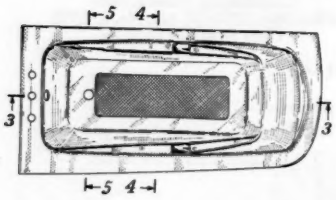


230,020
LAWN SPRINKLER
Douglas W. Anderson, deceased, late of Palatine, Ill., by Elizabeth A. Anderson, administratrix, Palatine, Ill., assignor to Burgess Vibrocrafters, Inc., Grayslake, Ill.
Filed Jan. 3, 1972, Ser. No. 215,236
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—8

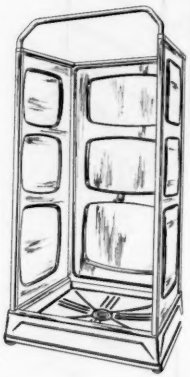


230,021
BATHTUB
Andre Primault, Noyon, France, assignor to Societe Generale de Fonderie, Paris, France
Filed Aug. 7, 1972, Ser. No. 278,692
Claims priority, application France May 26, 1972
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55

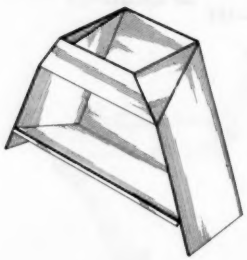




230,022
SHOWER STALL OR SIMILAR ARTICLE
Stig Tore Johannes Löfgren, Taby, Sweden, assignor to Innovare Aktiebolag, Taby, Sweden
Filed Mar. 30, 1972, Ser. No. 239,834
Claims priority, application Sweden Sept. 30, 1971
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—57



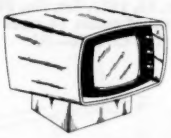
230,023
COMBINED FIREPLACE SMOKE CHAMBER AND DOWNDRAFT SHELF
George F. Haney, 536 S. Indiana, Anaheim, Calif. 92805, and Woody G. McClain, 4377 S. Huron, Englewood, Colo. 80110
Filed Dec. 23, 1971, Ser. No. 211,832
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94

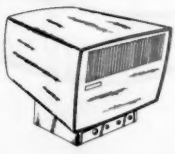


230,024
DEVICE FOR TEACHING THE TELLING OF TIME
Carroll E. Sand, Wheaton, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Mar. 15, 1972, Ser. No. 235,097
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1 R

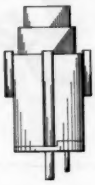
230,025
VISUAL PROOF TERMINAL FOR ALUMINUM WIRE CONDUCTOR
Ronald Clarence Hoffman, Williamstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jan. 14, 1972, Ser. No. 218,042
Term of patent 14 years
The portion of the term of the patent subsequent to June 12, 1987, has been disclaimed
Int. Cl. D13—*03*
U.S. Cl. D26—1 A

230,026
VIDEO MONITOR UNIT
John Davis Sims, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 27, 1971, Ser. No. 175,812
Term of patent 14 years
Int. Cl. D14—*02, 03*
U.S. Cl. D26—5 C



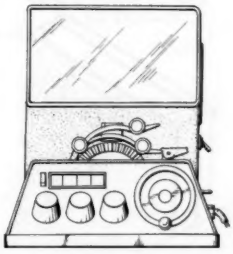


230,027
PUSH-BUTTON SWITCH
Edward G. Mueller, Council Bluffs, Iowa, assignor to George Risk Industries, Inc., Kimball, Nebr.
Continuation-in-part of design application Ser. No. 24,714, Aug. 26, 1970, now Patent No. 224,114, dated July 4, 1972. This application June 23, 1972, Ser. No. 265,800
Term of patent 14 years
The portion of the term of the patent subsequent to July 4, 1986, has been disclaimed
Int. Cl. D13—*03*
U.S. Cl. D26—13 R



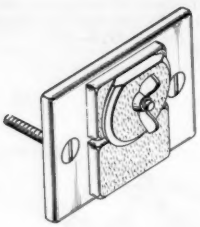
230,028
REED SWITCH ENVELOPE
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 27, 1972, Ser. No. 275,839
Term of patent 14 years
The portion of the term of the patent subsequent to Oct. 13, 1984, has been disclaimed
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

230,029
PICTURE-SOUND RECORDING APPARATUS
Dennis Knife, Wantagh, and Bernard A. Stone, New York, N.Y., assignors to Syncro-System Corp., New York, N.Y.
Filed Aug. 21, 1972, Ser. No. 282,149
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B

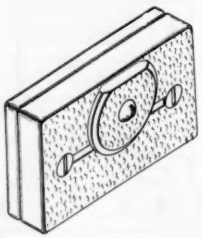


230,030
FIBER OPTIC DECORATIVE ORNAMENT
Jeffrey L. Monroy, Santa Ana, Calif., assignor to Poly-Optics, Inc.
Filed June 11, 1971, Ser. No. 152,482
Term of patent 3½ years
Int. Cl. D11—*05*
U.S. Cl. D29—1 B

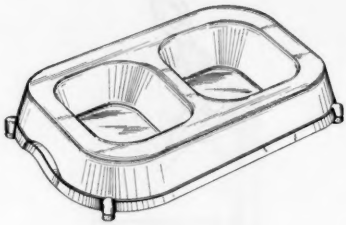
230,031
HOLDER FOR FOOD BOWL FOR PETS
Tony Robert, 5701 Southwest Freeway, Houston, Tex. 77027
Filed July 10, 1972, Ser. No. 269,953
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



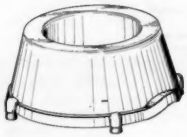
230,032
HOLDER FOR A FOOD BOWL FOR PETS OR SIMILAR ARTICLE
Tony Robert, 5701 Southwest Freeway, Houston, Tex. 77027
Filed Nov. 15, 1972, Ser. No. 306,568
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



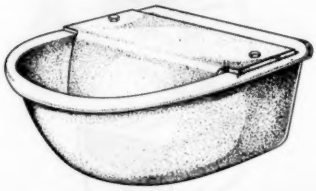
230,033
TWIN COMPARTMENT ANIMAL FEEDING BOWL
Marvin A. Goldman, Great Neck, and Jerome N. Goldman, New York, N.Y., assignors to Penn Plax Plastics, Inc., Jamaica, N.Y.
Filed Jan. 6, 1972, Ser. No. 215,989
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16



230,034
ANIMAL FEEDING BOWL
Marvin A. Goldman, Great Neck, and Jerome N. Goldman, New York, N.Y., assignors to Penn Plax Plastics, Inc., Jamaica, N.Y.
Filed Jan. 6, 1972, Ser. No. 215,707
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16

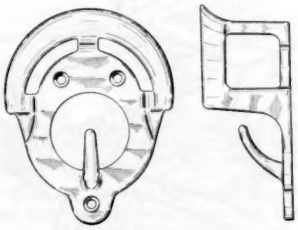


230,035
AUTOMATIC ANIMAL WATERING APPARATUS
Jay D. Bowman, 2271 Hillside, Norco, Calif. 91760
Filed Apr. 10, 1972, Ser. No. 242,892
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16



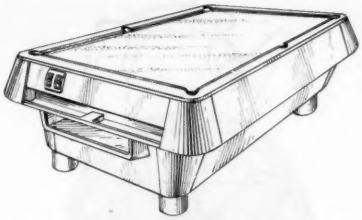
230,036
TAIL ENGAGED DOG CONTROL HARNESS
John P. Francis, 20 Boston St., Haverhill, Mass. 01830
Filed Apr. 28, 1972, Ser. No. 248,778
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—38

230,037
BRIDLE HOLDING DEVICE
William H. Hawn, Corpus Christi, Tex., assignor to Hawn Arabian Ranch, Corpus Christi, Tex.
Filed June 29, 1972, Ser. No. 267,698
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—45

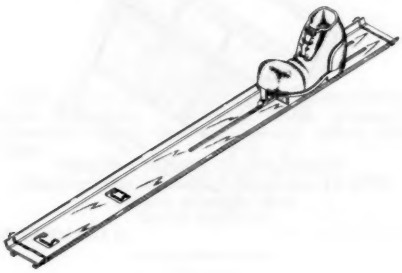


230,038
ANIMAL SECURING GATE
Cecil L. Tansel, Rte. 4, Box 165, Chandler, Okla. 74834
Filed July 3, 1972, Ser. No. 268,881
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99

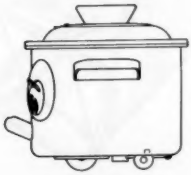
230,039
BILLIARD TABLE
Philip E. Crossman, 1435 E. Mason, Green Bay, Wis. 54301
Filed Mar. 8, 1972, Ser. No. 233,996
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—3



230,040
TOY VEHICLE LAUNCHER
Raymond M. Toy, Los Angeles, Alan W. B. Nash, Torrance, and Brian S. Prodger, Los Angeles, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 13, 1971, Ser. No. 207,725
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

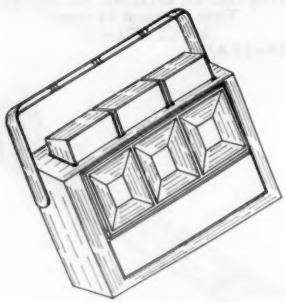


230,041
TOY COOKING POT
Shigeru Saito, 6–4, 2-chome, Kuramae, Tokyo, Japan
Filed Mar. 1, 1972, Ser. No. 231,067
Claims priority, application Japan Nov. 9, 1971
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 D

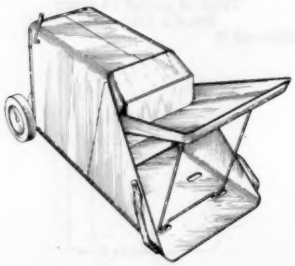


230,042
TOY TEA POT
Shigeru Saito, 6–4, 2-chome, Kuramae, Tokyo, Japan
Filed Mar. 1, 1972, Ser. No. 231,068
Claims priority, application Japan Nov. 9, 1971
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 D

230,043
EDUCATIONAL TOY ADDING MACHINE
Michael Langieri, Jr., Butler, N.J., assignor to Questor Corporation, Toledo, Ohio
Filed Jan. 31, 1972, Ser. No. 222,431
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 A

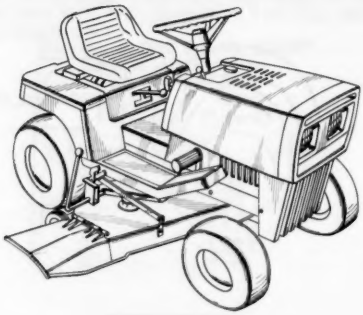


230,044
HOUSING OF A LEAF MILL OR THE LIKE
Daniel C. Koturov, Sheboygan, Wis., assignor to Gilson Bros. Co., Plymouth, Wis.
Filed Apr. 19, 1972, Ser. No. 245,685
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D35—2 A

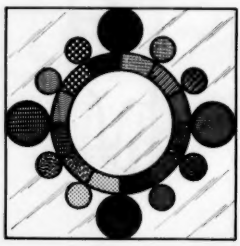


230,045
DRILL BIT SHARPENER
Michael P. Ballone, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed Nov. 1, 1971, Ser. No. 194,792
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D37—1 A

230,046
RIDING MOWER
William L. Manofsky, Nashville, Tenn., assignor to The Murray Ohio Manufacturing Co., Nashville, Tenn.
Filed Feb. 20, 1973, Ser. No. 334,097
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 D



230,047
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Higashinada-ku, Kobe, Japan
Filed Oct. 13, 1971, Ser. No. 189,054
Claims priority, application Japan Apr. 15, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B

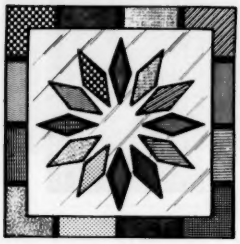


230,048

TIME-INDICATING FACE FOR A HOROLOGE

Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Higashinada-ku, Kobe, Japan

Filed Oct. 13, 1971, Ser. No. 189,055
Claims priority, application Japan Apr. 15, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B

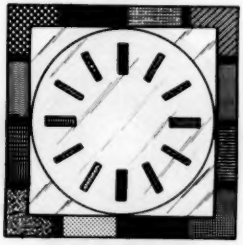


230,049

TIME-INDICATING FACE FOR A HOROLOGE

Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan

Filed Oct. 13, 1971, Ser. No. 189,056
Claims priority, application Japan Oct. 15, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B

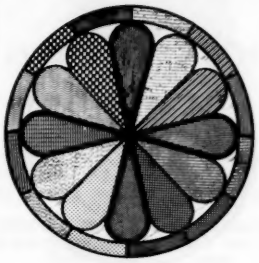


230,050

TIME-INDICATING FACE FOR A HOROLOGE

Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan

Filed Oct. 13, 1971, Ser. No. 189,058
Claims priority, application Japan Apr. 15, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B



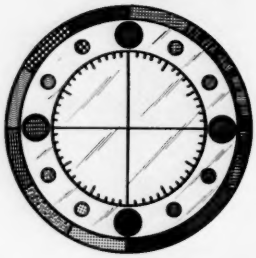
230,051

TIME-INDICATING FACE FOR A HOROLOGE

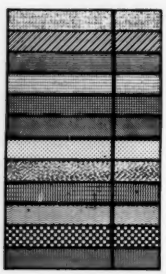
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan

Filed Oct. 13, 1971, Ser. No. 189,059
Claims priority, application Japan Apr. 15, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B

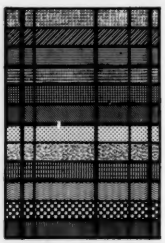
230,052
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 13, 1972, Ser. No. 189,061
Claims priority, application Japan Apr. 15, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B



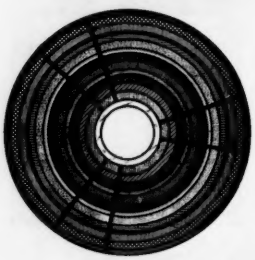
230,053
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 13, 1971, Ser. No. 189,062
Claims priority, application Japan Apr. 15, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B



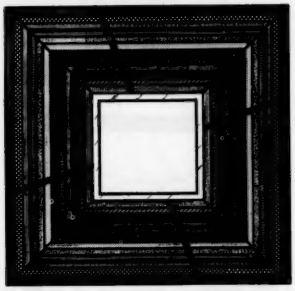
230,054
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 13, 1971, Ser. No. 189,063
Claims priority, application Japan Apr. 15, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B



230,055
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 13, 1971, Ser. No. 189,064
Claims priority, application Japan Apr. 15, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B

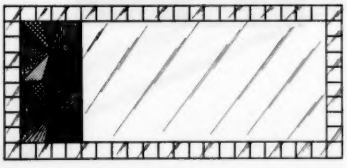


230,056
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 13, 1971, Ser. No. 189,065
Claims priority, application Japan Apr. 15, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B

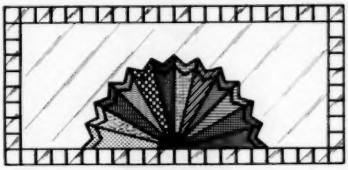


230,057
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 26, 1971, Ser. No. 192,678
Claims priority, application Japan Apr. 27, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B

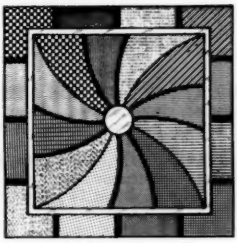
230,058
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 26, 1971, Ser. No. 192,679
Claims priority, application Japan Apr. 27, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B



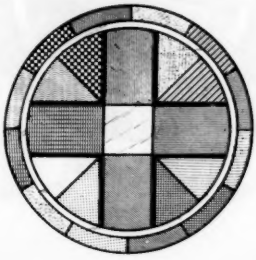
230,059
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 26, 1971, Ser. No. 192,680
Claims priority, application Japan Apr. 27, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B



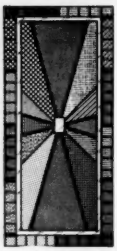
230,060
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 26, 1971, Ser. No. 192,681
Claims priority, application Japan Apr. 27, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B



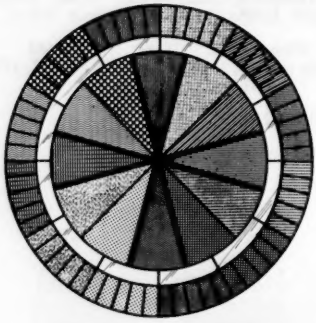
230,061
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 26, 1971, Ser. No. 192,682
Claims priority, application Japan Apr. 27, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B



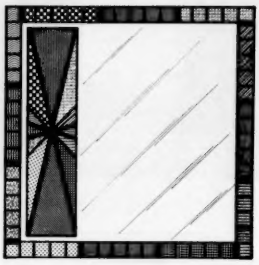
230,062
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 26, 1971, Ser. No. 192,683
Claims priority, application Japan Apr. 27, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B



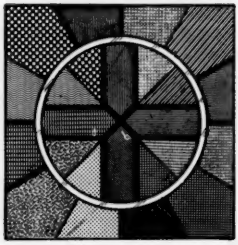
230,063
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 26, 1971, Ser. No. 192,684
Claims priority, application Japan Apr. 27, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B



230,064
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 26, 1971, Ser. No. 192,685
Claims priority, application Japan Apr. 27, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B

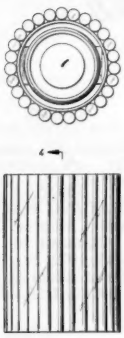


230,065
TIME-INDICATING FACE FOR A HOROLOGE
Shigeru Fukumoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Suncrux Research Office, Kobe, Japan
Filed Oct. 26, 1971, Ser. No. 192,686
Claims priority, application Japan Apr. 27, 1971
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B

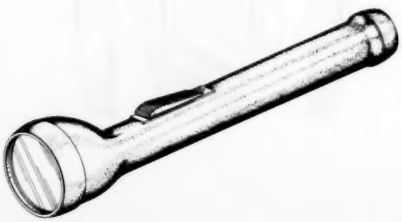


230,066
JEWELRY FINDING OR SIMILAR ARTICLE
Robert S. Grandy, 731 S. Vine St.,
Hinsdale, Ill. 60521
Filed Sept. 16, 1971, Ser. No. 163,115
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—19 R

230,067
COMBINED CANDLE AND HOLDER THEREFOR
Roy Van Horn, Jr., Houston, Tex., assignor to Van
Horn Hayward, Houston, Tex.
Filed Oct. 27, 1971, Ser. No. 193,229
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2

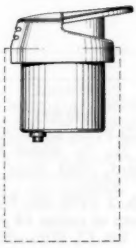


230,068
FLASHLIGHT
Jody L. Numbers, Scottsdale, Ariz., assignor to
Daco Safety Products, Inc., Tempe, Ariz.
Filed Nov. 27, 1972, Ser. No. 309,763
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

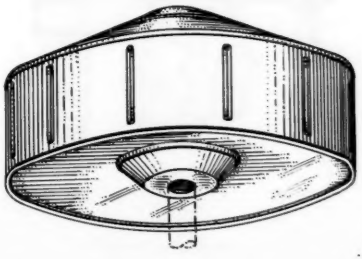


230,069
CIGARETTE LIGHTER
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga
Prince Co., Ltd., Taito-ku, Japan
Filed Apr. 27, 1972, Ser. No. 248,339
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27 R

230,070
HEAD FOR CIGARETTE LIGHTER
FOR TABLE USE
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga
Prince Co., Ltd., Tokyo, Japan
Filed Dec. 6, 1972, Ser. No. 312,599
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27 R

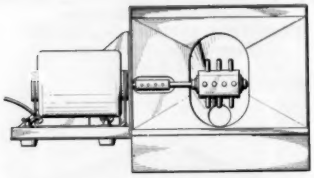


230,071
LUMINAIRE
Eldon L. Anderson, Jr., Fletcher, N.C., assignor to
General Electric Company
Filed May 4, 1972, Ser. No. 250,472
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



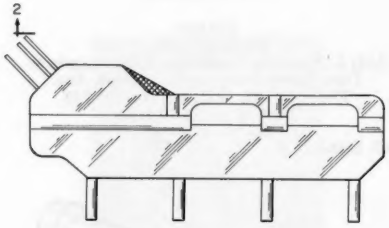
230,072
FOOD WARMER
Roderick J. Chaudoir, Milwaukee, Wis., assignor to Hatco Corporation, Milwaukee, Wis.
Filed Aug. 2, 1971, Ser. No. 168,523
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D55—1 J

230,073
FEATHER PLUCKING MACHINE
Raleigh F. Lane, Jr., % Third National Bank, and Alexander J. Baird, 3503 Echo Hill Road, both of Nashville, Tenn. 37215
Filed Feb. 2, 1972, Ser. No. 223,047
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D55—1 E

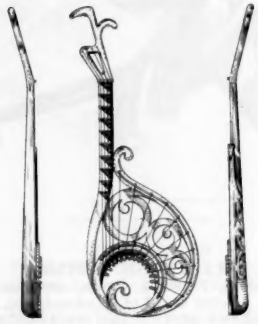


230,074
PAPERBOARD BLANK FEEDER BAR WITH LONGITUDINALLY ALIGNED AND SPACED FEED CLIPS
Clyde B. Garrett, Lanham, Albert L. Lulie, Baltimore, and William S. Thayer, Luthervillle, Md., assignors to Koppers Company, Inc.
Filed Oct. 4, 1971, Ser. No. 186,581
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 H

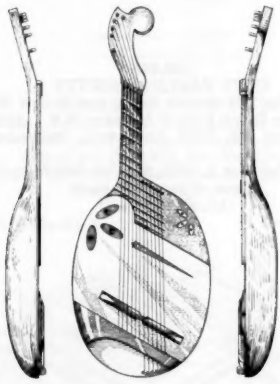
230,075
PACKAGING MACHINE
Earle C. Sherman, Monroe, La., assignor to Olinkraft, Inc.
Filed Feb. 11, 1972, Ser. No. 225,696
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 C



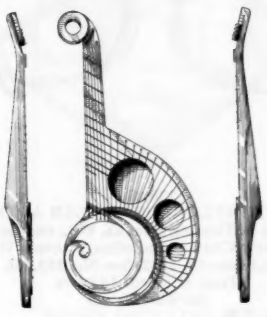
230,076
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Filed May 9, 1972, Ser. No. 251,854
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



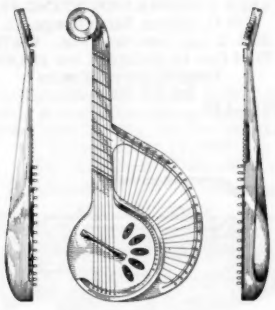
230,077
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Filed May 16, 1972, Ser. No. 253,921
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



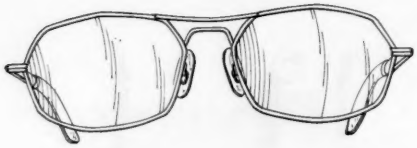
230,078
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Filed May 16, 1972, Ser. No. 253,923
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



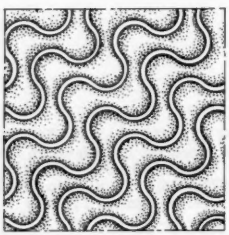
230,079
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Filed May 16, 1972, Ser. No. 253,924
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



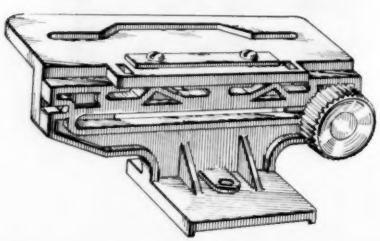
230,080
PAIR OF SPECTACLES
Richard R. Maiese, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 24, 1972, Ser. No. 220,562
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F



230,081
PAPER TOWELING OR SIMILAR ARTICLE
Gordon D. Thomas, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed June 19, 1972, Ser. No. 263,866
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 B

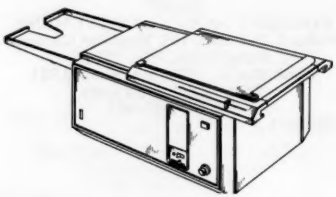


230,082
ADJUSTABLE CAMERA MOUNTING PLATFORM
Neil D. Adams, Baton Rouge, La.
(R.R. 2, Ste. Genevieve, Mo. 63670)
Filed Oct. 12, 1971, Ser. No. 188,638
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 G

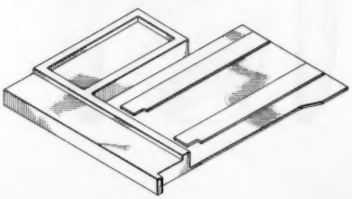


230,083
CAMERA HOLDER
Neil D. Adams, Baton Rouge, La.
(R.R. 2, Ste. Genevieve, Mo. 63670)
Filed Oct. 12, 1971, Ser. No. 188,639
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 G

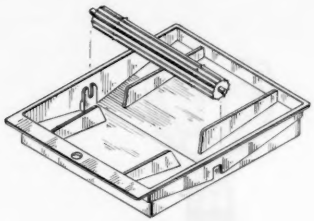
230,084
ELECTRONIC COPIER
Kazuteru Nagata, Fujisawa, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Oct. 26, 1971, Ser. No. 192,675
Claims priority, application Japan Apr. 27, 1971
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



230,085
COPY PAPER CASSETTE
James T. Alllis, 541 Adams Road; and Robert N. Beers, 111 Angean Drive, both of Webster, N.Y. 14580; and Louis Marth III, 1209 East Ave., Rochester, N.Y. 14607
Filed May 2, 1972, Ser. No. 249,744
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q

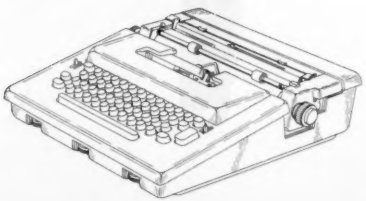


230,086
COMBINED RECEPTACLE AND ROLLER FOR A PAINT METERING DEVICE
Edward H. Meisner, Dumont, N.J., assignor to Red Devil Inc., Union, N.J.
Filed Jan. 17, 1972, Ser. No. 218,640
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D64—18

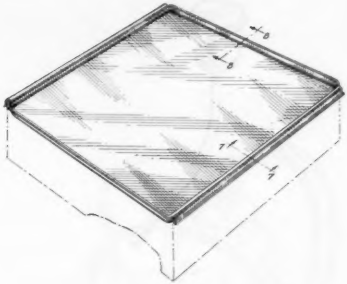


230,087
TYPEWRITER
Frank C Fusco, Monroe, and Bill Gold, Great Neck, N.Y., assignors to Louis Marx & Co., Inc., New York, N.Y.
Filed Aug. 10, 1971, Ser. No. 170,530
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A

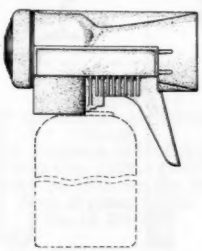
230,088
PORTABLE TYPEWRITER
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Torino, Italy
Filed July 25, 1972, Ser. No. 274,943
Claims priority, application Italy Feb. 15, 1972
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A



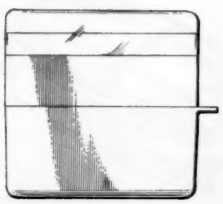
230,089
REFRIGERATOR DRAWER COVER
Harry R. Shanks, Glen Ellyn, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed June 12, 1972, Ser. No. 261,643
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D67—3 B



230,090
POWER OPERATED HORN
Michael Pappas, Irvington, N.J., assignor to Falcon Safety Products, Inc., Mountainside, N.J.
Filed Aug. 16, 1971, Ser. No. 172,357
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1 C

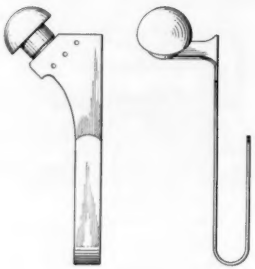


230,091
LIGHT FLASHER
Robert A. Redstone, West Covina, Calif., assignor to Survival & Rescue Inc., Sierra Madre, Calif.
Filed Mar. 29, 1972, Ser. No. 239,412
Term of patent 14 years
Int. Cl. D29—*02*; D26—*02*
U.S. Cl. D72—1 E

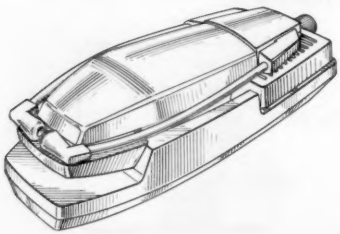


230,092
OBTURATOR FOR PEDIATRIC TRACHEOSTOMY TUBE
George M. Johnson, La Palma, Calif., assignor to Shirley Laboratories, Inc., Santa Ana, Calif.
Filed Mar. 30, 1973, Ser. No. 346,339
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—1 K

230,093
OFF-SET TRIAL PROSTHESIS DEVICE FOR USE IN HIP PROSTHESIS SURGERY
William Minor Deyerle, 2222 Monument Ave., Richmond, Va. 23220
Filed May 1, 1973, Ser. No. 356,365
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—1 E



230,094
STETHOSCOPE AND STAND
Stephen G. Hauser, Tarzana, Calif., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed Sept. 15, 1972, Ser. No. 289,505
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 R



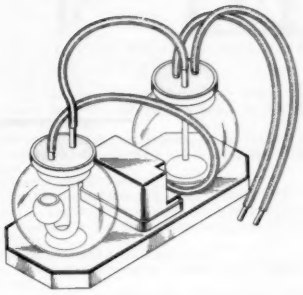
230,095
EXTRACTOR FOR USE IN IMPLANTING PROSTHESIS IN TOTAL KNEE ORTHOPEDIC PROCEDURE
Robert T. Rylee II, 411 N. 3rd at Parkway, Memphis, Tenn. 38105
Filed Feb. 20, 1973, Ser. No. 332,250
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12

230,096
TEMPLATE FOR USE IN IMPLANTING PROSTHESIS IN TOTAL KNEE ORTHOPEDIC PROCEDURE
Robert T. Rylee II, 411 N. 3rd at Parkway, Memphis, Tenn. 38105
Filed Feb. 14, 1973, Ser. No. 332,251
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12

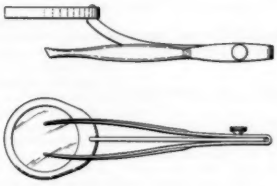
230,097
PUSHER FOR USE IN IMPLANTING PROSTHESIS IN TOTAL KNEE ORTHOPEDIC PROCEDURE
Robert T. Rylee II, 411 N. 3rd at Parkway, Memphis, Tenn. 38105
Filed Feb. 14, 1973, Ser. No. 332,252
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 R

230,098
SAW GUIDE FOR USE IN IMPLANTING PROSTHESIS IN TOTAL KNEE ORTHOPEDIC PROCEDURE
Robert T. Rylee II, 411 N. 3rd at Parkway, Memphis, Tenn. 38105
Filed Feb. 14, 1973, Ser. No. 332,253
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 R

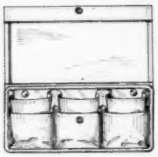
230,099
WATER PIPE
Edward R. Orr, 1424½ Portia, Los Angeles, Calif. 90026
Filed Dec. 18, 1972, Ser. No. 316,391
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D85—8 A



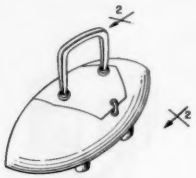
230,100
COMBINED TWEEZERS AND MAGNIFYING GLASS
Pearley W. Hornbeck, 928 Wildwood Ave., Daly City, Calif. 94015
Filed Oct. 24, 1972, Ser. No. 300,169
Term of patent 7 years
Int. Cl. D8—*05*
U.S. Cl. D86—10 B



230,101
CARRYING CASE FOR CASSETTES
Morris L. Green, 239 Paramount Ave., Salt Lake City, Utah 84115
Filed May 10, 1971, Ser. No. 142,119
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



230,102
LADY'S HANDBAG
Elton Reneau, Rte. 1, Box 302, Red Oak, Tex. 75154
Filed June 2, 1972, Ser. No. 259,360
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F



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PATENTS WERE ISSUED ON THE 22D DAY OF JANUARY, 1974

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Abarotin, Eugene V2, to United States Steel Corporation. Method and apparatus for preparing the ends of cables for splicing. 3,786,697, Cl. 81-9.510.

Abbott Laboratories: *See—*
Flouret, George Rogelio; and Cole, John Wayne, 3,787,386.

Abbott, Steven R.: *See—*
Carini, Francis F.; and Abbott, Steven R., 3,787,255.

ABC Bending Enterprises: *See—*
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Ablett, Allan H. Bracket for poles and the like. 3,787,015, Cl. 248-43.000.

Abrahamson, Boris Hougham: *See—*
Abrahamson, Walter Frank; Abrahamson, John Hougham; and Abrahamson, Boris Hougham, 3,786,782.

Abrahamson, John Hougham: *See—*
Abrahamson, Walter Frank; Abrahamson, John Hougham; and Abrahamson, Boris Hougham, 3,786,782.

Abrahamson, Walter Frank; Abrahamson, John Hougham; and Abrahamson, Boris Hougham. Milk flow sensing valve for teat cup release. 3,786,782, Cl. 119-14.080.

Abramson, Carl Newton; and Nadir, Mark T., to Adaptive Technology, Inc. Central address distributor. 3,787,627, Cl. 179-15.0ba.

Acheson, Melvin G. Carpet plug cutter. 3,786,564, Cl. 30-124.000.

Acieries de Paris & d'Ortreau: *See—*
Perrot, Robert, 3,787,680.

Acker, Ellsworth G.; and Winyall, Milton E., to Grace, W. R., & Co. Loosely aggregated 100 millimicron micellular silica. 3,787,561, Cl. 423-339.000.

Acker, Frederick L.: *See—*
Roberts, Charles B.; and Acker, Frederick L., 3,787,225.

Acron Products Company: *See—*
Difazio, Joseph, 3,786,609.

Adams, Charles Wesley, to Lubrizol Corporation, The. Process for preparing high molecular weight carboxylic compositions. 3,787,374, Cl. 260-78.40d.

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Ashby, Robin; and Adams, Terence Ernest, 3,787,758.

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Nowicki, Thomas; Shipp, John I.; Hines, Robin H.; and Broadbent, Thomas D., 3,787,118.

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Aglitsky, Vladimir Efimovich: *See—*
Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Suladze, Ippolit Davidovich; Aglitsky, Vladimir Efimovich; Kakhniashvili, Avtandil Semenovich; Kantor, Ilia Solomonovich; Dzhanelidze, Vazha Venediktovich; and Lachinov, Alexandr Alexandrovich, 3787,007.

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Hurt, Zeno, 3,786,626.

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Finnemore, Harlan E., 3,786,868.

Airco, Inc.: *See—*
Rich, Harold T.; and Wolf, Terrence L., 3,786,644.

Aishima, Itsuho; Sakurai, Hisaya; Takashi, Yukichi; Morita, Hideo; Hirotsu, Yoshiyuki; and Hamada, Tetsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Production of ethylene polymers and ethylene copolymers. 3,787,323, Cl. 260-88.20f.

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Haga, Shoji; and Komorizono, Kunichi, 3,786,903.
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Akashi, Goro: *See—*
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Corkum, James L.; Schoepflin, David; and Taylor, Paul A., 3,786,762.

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Arvin Industries, Inc.: *See—*
Murphy, Timothy C., 3,787,742.
Waldspurger, Edward C., 3,787,614.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Aishima, Itsuho; Sakurai, Hisaya; Takashi, Yukichi; Morita, Hideo; Hirotsu, Yoshiyuki; and Hamada, Tetsuo, 3,787,323.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Shimizu, Tatsuro, 3,787,116.

Ashar, Kanu, to International Business Machines Corporation. Emitter diffusion isolated semiconductor structure. 3,787,253, Cl. 148-175.000.

Ashby, Robin; and Adams, Terence Ernest, to Smiths Industries Limited. Apparatus including displacement-responsive inductive-transducers. 3,787,758, Cl. 323-51.000.

Astill, Cyril J., to Canadian Patents and Development, Limited. Valve stem packing assembly. 3,787,060, Cl. 277-69.000.

Atac, Muzaffer, to United States of America, Atomic Energy Commission. Quenching gas for detectors of charged particles. 3,787,746, Cl. 313-93.000.

Athlon Corporation, The: *See—*
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Atkins, Cedric D.; and Attaway, John A. Method of producing enhanced citrus juice essence. 3,787,593, Cl. 426-429.000.

Atlantic Richfield Company: *See—*
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Atlas Copco: *See—*
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Atomenergikommissionen: *See—*
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Atomic Energy of Canada, Limited: *See—*
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Atron Industries, Inc.: *See—*
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Attaway, John A.: *See—*
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Auber, Yvan: *See—*
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Ausseil, Claude C. A. Swimming-aid devices. 3,786,526, Cl. 9-307.000.

Automatic Power Division: *See—*
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Douglas-Hamilton, Diarmaid H., 3,787,759.

Avery, Peter J., to Aluma Building Systems Incorporated. Concrete forming structure. 3,787,020, Cl. 249-18.000.

Aya, Hasahiro; Saito, Junichi; Fukazawa, Nobuo; Tamura, Tatsuo; Kurihara, Kazuo; and Norishima, Norihisa, to Bayer Aktiengesellschaft. Novel urea derivatives and their use as herbicides. 3,787,393, Cl. 260-239.0bf.

Aya, Masahiro: *See—*
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Backlin, Olle, to Allmann Svenska Elektriska Aktiebolaget. Means for cutting plates for transformer cores. 3,786,710, Cl. 83-406.000.

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Volkert, Otto; Schrodt, Gerd; and Zuerger, Manfred, 3,787,211.

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Bagby, Percy R. Self-releasing and self-lowering block. 3,787,032, Cl. 254-190.000.

Bagge, Erich; Trumper, Joachim; and Knaak, Joachim, to Vdo Tachometer Werke Adolf Schindling GmbH. Apparatus for measuring the filling level in liquid receiving containers by means of radioactive rays. 3,787,682, Cl. 250-43.5fl.

Baird-Atomic, Inc.: *See—*
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Baker Hydro, Inc.: *See—*
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Baker, William H. Angle connectors for modular beam structures. 3,786,612, Cl. 52-754.000.

Balaian, Ruben Dzhangirovich: *See—*
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Ballard, Norman Edmund, to Rolls-Royce (1971) Limited. Method of applying a coating to a part. 3,787,305, Cl. 204-181.000.

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Bando, Yasuo: *See—*
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Banner Industries, Inc.: *See—*
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Bard, C. R., Inc., mesne: *See—*
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Barlow, John: *See—*
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Barnett, Charles B.; and Ekama, Pieter J., to Diebold Incorporated. Pneumatic tube system carrier wear ring construction. 3,787,008, Cl. 243-35.000.

Barnette, Stanley Ronald. Method of making plastic articles with a partially enveloped core. 3,787,544, Cl. 264-69.000.

Barok, Albert. Telephone set with transmission by microphone and amplifier and reception by loudspeaker. 3,787,621, Cl. 179-1.0hf.

Barr, John E., to International Telephone and Telegraph Corporation. Low cost sealed connector and method of making same. 3,787,796, Cl. 339-60.00r.

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Barrett, Lawrence D., Jr., to Boeing Company, The. Redundant pitch link. 3,786,695, Cl. 74-586.000.

Bartels, Friedrich. Element for constructing temporary wall structures. 3,786,607, Cl. 52-474.000.

Bartoszewicz, John S.: *See—*
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Bauer, Stuart M., to Pfizer Inc. Process for preparing pre-moistened antimicrobial towels. 3,786,615, Cl. 53-21.0fc.

Baumann, Andrew A. Expansible chamber device. 3,786,727, Cl. 91-493.000.

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Bayer, Horst O.; Hurt, William S.; and Aller, Harold E., to Rohm & Haas Company. 3-Phosphorylthio acrylamides. 3,787,536, Cl. 260-943.000.

Bean, Roger M., to Sun Research and Development Co. Conversion of isobutane to isobutene. 3,787,516, Cl. 260-683.300.

Bearden, Roby, Jr.; and Fink, Thomas E., to Esso Research and Engineering Company. Alkali metal desulfurization process for petroleum oil stocks using low pressure hydrogen. 3,787,315, Cl. 208-208.00m.

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Beck, Fritz; Haufe, Juergen; and Nohe, Heinz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Electrolytic condensation of carboxylic acids. 3,787,299, Cl. 204-59.00r.

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Becker, Kurt; and Seidel, Hans-Georg, to Heye, Hermann. Apparatus for cutting off successive portions from a strand of plastic material such as a strand of viscous glass. 3,786,707, Cl. 83-299.000.

Becker, Kurt; and Seidel, Hans-Georg, to Heye, Hermann. Apparatus for feeding gobs of molten vitreous or plastic material into molds of a machine for forming bottles or similar containers with control means for controlling the movement of the molds. 3,787,96, Cl. 65-164.000.

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Beebe, John N., to Raytheon Company. High performance meter depth sounder for automatically indicating depth without manual adjustment. 3,787,803, Cl. 340-3.00r.

Beers, Albert Alvin, Jr.; Stoyer, Paul Eugene; and Lightner, Joseph Campbell, Jr., to Greenville Steel Car Company. Rapid discharge hopper car. 3,786,764, Cl. 105-240.000.

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Behrenz, Wolfgang: *See*—
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Behunin, Gage B.; Cole, Eugene A.; and Staadt, Charles R., to Masonry Systems, Inc. Apparatus for dispensing flowable high-density material. 3,786,966, Cl. 222-387.000.

Bei, Pullach: *See*—
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Beneficial Insect Control, Inc.: *See*—
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Benghiat, Isaac, to Universal Oil Products Company. Novel flame retardant compositions. 3,787,528, Cl. 260-865.000.

Benghiat, Isaac, to Universal Oil Products Company. Novel flame retardant compositions. 3,787,529, Cl. 260-865.000.

Bennett, Charles D., to Cam Industries, Inc. Sequencing step control. 3,787,729, Cl. 307-41.000.

Bennett, James G.; and Katchman, Arthur, to General Electric Company. Preparation of polyphenylene ethers with dialkyl formamide promoted copper-amine catalysts. 3,787,362, Cl. 260-47.0et.

Benwilco, Inc.: *See*—
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Beohringer Mannheim GmbH: *See*—
Bergmeyer, Hans Ulrich; Haid, Eric; Nelboeck-Hochstetter, Michael; and Weimann, Gunther, 3,787,392.

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Berg, Lawrence F., to Caterpillar Tractor Company. Flow control valve. 3,786,827, Cl. 137-109.000.

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Bergmeyer, Hans Ulrich; Haid, Eric; Nelboeck-Hochstetter, Michael; and Weimann, Gunther, to Beohringer Mannheim GmbH. Process for the preparation of nucleoside diphosphate esters. 3,787,392, Cl. 260-211.50r.

Berman, Richard M.; and Schwartz, Bernard, to Alphamedics Mfg. Corporation. Hand-operated pipette. 3,786,683, Cl. 73-425.40p.

Bernard, Jean Paul, to Societe Anonyme Aerazur Constructions Aeronautiques. Safety valve with inertial opening control. 3,787,067, Cl. 280-150.0ab.

Bernusset, Philippe. Catalysts for selective hydrogenation of hydrocarbons. 3,787,514, Cl. 260-677.00h.

Berreman, Dwight Winton; Meiboom, Saul; White, Donald Lawrence; and Kahn, Frederic Jay, to Bell Telephone Laboratories, Incorporated. Liquid crystal devices. 3,787,110, Cl. 350-160.01c.

Berry, David A.; Bunk, Albert R.; Halbrook, Noah J.; and Lawrence, Ray V., to United States of America, Agriculture. Hot-melt adhesive composition containing glycerol ester of fumaric-modified rosin. 3,787,342, Cl. 260-24.000.

Bersworth, Frederick C. Method of synthesizing hydrazine compounds carboxylic acids. 3,787,482, Cl. 260-482.00p.

Beutler, Hervey F., to Dow Corning Corporation. Shipping and display carton. 3,786,914, Cl. 206-44.00r.

Bieker, Ron D.; and Rickel, E. O., to Rickel, Inc. Lift support device for use with truck weighing scales. 3,787,030, Cl. 254-8.00r.

Bielfeldt, Friedrich Bernd, to Eckert & Ziegler GmbH. Apparatus for injection molding with thermosetting resins. 3,787,159, Cl. 425-167.000.

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Biospherics Incorporated: *See*—
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Birkenmeyer, Robert D., to Upjohn Company, The. Analogs of lincomycin and process. 3,787,390, Cl. 260-210.00r.

Birkin, Michael S.; and Parkman, William T., to British Railways Board. Train communication system. 3,787,679, Cl. 246-30.000.

Bishop, Wilson P., to United States of America, Navy. Close-in ranger system. 3,787,846, Cl. 343-7.300.

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Blaivas, Murray Aaron, to Hoffmann-La Roche Inc. Blood collection container. 3,786,985, Cl. 233-26.000.

Blanchet, Francis; and Sauron, Georges, to Commissariat a l'Energie Atomique. High-density magnetic memory. 3,787,824, Cl. 340-174.0dc.

Blank, Izhak, to Hydrophilics International, Inc. Optical contact lenses and related devices. 3,787,378, Cl. 260-86.10r.

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Blecke, Ronald Gene, to Gulf Research & Development Company. High molecular weight, high melting, linear polyamides prepared from trans, trans-4,4-diaminobicyclohexyl. 3,787,375, Cl. 260-78.00r.

Block, Leo; and Shippey, Frank R., to Raypak, Inc. Means for sealing membrane carrying tubes. 3,786,925, Cl. 210-321.000.

Blocker, Erich; and Eckhardt, Peter, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the preparation of aromatic copolyamide-phosphonamides. 3,787,372, Cl. 260-78.00r.

Blomberg, Peter Erik, to Aktiebolaget Electrolux. Absorption refrigeration system of the inert gas type. 3,786,653, Cl. 62-491.000.

Bloxsom, Joseph Thomas, to Lemay, A., Co., Inc. Contour grinder. 3,786,600, Cl. 51-101.01g.

Blundell, Thomas: *See*—
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Blymiller, Arthur L.; and Snodgrass, John E., to United States of America, Air Force. Instantaneous signal resolution system. 3,787,864, Cl. 343-113.00r.

Boardman Company, The: *See*—
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Bock, Wallace O. Exercise device. 3,787,048, Cl. 272-57.00r.

Bodway, George E. Fabrication of thin film resistors. 3,786,557, Cl. 29-620.000.

Boehringer Mannheim GmbH: *See*—
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Boeing Company, The: *See*—
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Buehler, Walter E.; and Lunden, Clarence D., 3,787,841.

Boeticher, William A. Flooring sleeper assembly. 3,786,608, Cl. 52-480.000.

Bohn, Lothar; Cherdron, Harald; Fleissner, Manfred; and Herwig, Walter, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Crystal-clear thermoplastic moulding compositions of linear polyester and styrene-acrylanitrilic copolymer mixures. 3,787,530, Cl. 260-873.000.

Bohringer Mannheim GmbH: *See*—
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Bolhofer, William A., to Merck and Company, Inc. B-picolyloxy ester of (3-trifluoromethyl phenoxy)(4-chlorophenyl) acetic acid and derivatives. 3,787,423, Cl. 260-295.50r.

Boliden Aktiebolag: *See—*
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Bolin, Larry R.; and Jolly, Shelby A., to General Electric Company. Microwave-excited light emitting device. 3,787,705, Cl. 315-248.000.

Bolinger, William Russell. Time delay alarm system. 3,787,832, Cl. 340-276.000.

Bollinger, Edwin: *See—*
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Bolynn, Andrew T. Refrigerating apparatus. 3,786,652, Cl. 62-243.000.

Bombardier, Jerome, to Bombardier Limited. Bracket assembly for snowmobile skis. 3,786,886, Cl. 180-5.00r.

Bombardier Limited: *See—*
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Bonny, Jean-Pierre, to Portescap. Striker for printing chronocomparator diagrams. 3,787,890, Cl. 346-141.000.

Boom, Roger John: *See—*
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Borden Company, The: *See—*
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Borders, Bert; Rivkowich, Harold; and Rehman, Warren C., to Tetley, Inc., mesne. Method for solubilizing tea cream. 3,787,590, Cl. 426-366.000.

Borg, John P. Portable self-cleaning door mat. 3,786,531, Cl. 15-310.000.

Borg-Warner Corporation: *See—*
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Borger, Jurgen Herman; and Castellanos, Rafael A., to Victor Comptometer Corporation. Solenoid for wire printer. 3,787,791, Cl. 335-274.000.

Borie, Robert: *See—*
Carbonnel, Henry; and Borie, Robert, 3,787,143.

Bork, Klaus: *See—*
Kattner, Erich; and Bork, Klaus, 3,787,880.

Bosch, Robert, Fernsehanlagen GmbH: *See—*
Foerster, Hubert; and Brauch, Ulrich, 3,787,615.
Poetsch, Dieter; and Hess, Heinz, 3,787,611.

Bosch, Robert, G.m.b.H.: *See—*
von Loewis of Menar, Alexander, 3,787,095.

Bosch, Robert, Photokino GmbH: *See—*
Riedel, Wolfgang, 3,787,005.

Boshagen, Horst, to Farbenfabriken Bayer Aktiengesellschaft. N-disubstituted 3-amino-1,2-benzisothiazoles as antimycotic agents. 3,787,572, Cl. 424-244.000.

Boshinski, Edwin E.: *See—*
Allen, Kenneth C.; and Boshinski, Edwin E., 3,786,881.

Bosten, Donald R.: *See—*
Risko, Donald G.; Bosten, Donald R.; and Rusnak, Michael, 3,786,998.

Bostrowsky, Daniel: *See—*
Fritz, Erich; and Bostrowsky, Daniel, 3,787,779.

Bourdeau, Romeo G., to United Aircraft Corporation. Tungsten coated glass fiber. 3,787,236, Cl. 117-227.000.

Bowen, Lloyd: *See—*
Hilgedick, James R., 3,787,811.

Bowls, Victor C.; and Graham, D. Douglas. Emission control device for carburetor-equipped internal-combustion engines. 3,786,793, Cl. 123-119.00a.

Boylan, John R.: *See—*
Shufflebarger, Earl D.; Gallagher, Bernard J.; Simko, David M.; and Boylan, John R., 3,787,023.

Bozec, Christian H.; Dulong, Bernard G.; and Lemarinel, Robert Y., to Le Nickel. Electrolytic method for producing high-purity nickel from nickel oxide ores. 3,787,301, Cl. 204-112.000.

Bozzi, Marshall: *See—*
Wingerd, Winston Harold; Damisch, Russell; and Bozzi, Marshall, 3,787,216.

Bradbury, Joseph T.: *See—*
Hastings, Charles E.; Rounion, William A.; Comstock, Allen L.; and Bradbury, Joseph T., 3,787,844.

Brahman, Rodman S., to Heath Company. Automatic range switching for digital depth sounders. 3,787,802, Cl. 340-3.00r.

Braid, John E.: *See—*
Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, 3,787,503.

Brand, Warren L.; and Kashkooli, Farajollah, to Signetics Corporation. Mos semiconductor structure with increased field threshold and method for making the same. 3,787,251, Cl. 148-187.000.

Brandt, Edison R.; and Rice, Christopher R., to Polaroid Corporation. Magnetic recording and playback system for use with recording records adapted for use in conjunction with a photograph. 3,787,636, Cl. 179-100.20t.

Brandt, Inc.: *See—*
Johnson, George V.; and Bergman, Charles T., 3,787,664.

Brauch, Ulrich: *See—*
Foerster, Hubert; and Brauch, Ulrich, 3,787,615.

Braun, Leonard A.: *See—*
Schafer, Robert P.; Braun, Leonard A.; and Maki, Terrence C., 3,786,877.

Brawn, Darrell S. Ski motion simulating training device. 3,787,047, Cl. 272-57.00b.

Breaux, Onezime P.: *See—*
Medicus, Gostav K.; and Breaux, Onezime P., 3,787,781.

Brecker, Lawrence Robert, to Argus Chemical Corporation. Synergistic mercapto organotin stabilizers. 3,787,357, Cl. 260-45.75k.

Breitbart, George: *See—*
Spitabny, Arnold; Breitbart, George; and Sporn, Stanley R., 3,787,624.

Breslow, Jeffrey D.; and Kaelin, Bette Marie, to Marvin Glass & Associates. Animated musical figure toy. 3,786,596, Cl. 46-98.000.

Breslow, Jeffrey D., to Glass, Marvin, & Associates. Launching platform, spring launching element and target area. 3,787,053, Cl. 273-101.000.

Bretschneider, Hermann; Grassmayr, Klaus; Hohenlohe-Oehringen, Kraft; and Grussner, Andre. Substituted sulfonyl urea and its stereoisomers. 3,787,491, Cl. 260-553.00d.

Breuer, Oswald: *See—*
Hauschopp, Alois; Langem, Werne Lippe; Breuer, Oswald; Ostrop, Berthold; and Steinkuhl, Bernd, 3,787,090.

Brewer Sewing Supplies Company: *See—*
Nishi, Naoichi, 3,786,770.

Bridgestone Tire Company Limited: *See—*
Muramatsu, Tateo; Aramaki, Kuninori; and Kundo, Yoshtkazu, 3,786,637.
Yonekawa, Hisashi; and Miyaoka, Minoru, 3,787,263.

Briggs, Charles Clifford; and Lythe, Trevor Wilkinson, to Steetley (Mfg.) Ltd. Magnesium hydroxide production. 3,787,558, Cl. 423-164.000.

Bright, William L. Electrical power substation. 3,787,711, Cl. 317-103.000.

Brink, Edwin H.; and Palmer, Warren G., to FMC Corporation. Foam flotation concentration of sewage. 3,787,316, Cl. 210-6.000.

Brinkley, Max D.: *See—*
Appleby, Paul E.; Brinkley, Max D.; and Griffiths, Robert I., 3,787,262.

Brinkmann, Heinz: *See—*
Weegen, Lorenz; Luders, Albrecht; Brinkmann, Heinz; Herbst, Klaus; and Ernst, Gerd, 3,787,092.

Brinkmann, Ludwig; and Herwig, Walter, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Crystal-clear polyamides prepared by condensing bis(aminomethyl)-tricyclodecone with aromatic dicarboxylic acids. 3,787,371, Cl. 260-78.00r.

British Aircraft Corporation Limited: *See—*
Pyrah, Patrick Frank, 3,787,856.

British Leyland Truck & Bus Division Ltd.: *See—*
Hemmings, Keith Reginald; and Fowler, Gerald, 3,787,130.

British Railways Board: *See—*
Birkin, Michael S.; and Parkman, William T., 3,787,679.

Broadbent, Thomas D.: *See—*
Nowicki, Thomas; Shipp, John I.; Hines, Robin H.; and Broadbent, Thomas D., 3,787,118.

Brock, Andrew J.; and Pryor, Michael J., to Olin Corporation. Aluminum alloy. 3,787,249, Cl. 148-11.50a.

Brockway Glass Company, Inc.: *See—*
Snyder, Herbert C.; and De Santis, Urbano J., 3,787,197.

Broes, Frank, to Stradco Inventions & Research Co. Catamaran ships structure. 3,786,772, Cl. 114-43.500.

Brookner, Eli, to Raytheon Company. Coded multiple frequency signal system. 3,787,853, Cl. 343-8.000.

Brown & Root, Inc.: *See—*
Good, Alan E.; and Ward, Delbert R., 3,786,642.

Brown, Boyd E.; and Brown, Eric A., to Ordeco, Inc. Fastening system for joining structural members. 3,786,611, Cl. 52-753.00j.

Brown, David A.: *See—*
Plumley, Elizabeth Emmett; and Brown, David A., 3,786,741.

Brown, Eric A.: *See—*
Brown, Boyd E.; and Brown, Eric A., 3,786,611.

Brown, Gaylord W.; and Pickard, George L., to Koehring Company. Twin sheet thermoformer. 3,787,158, Cl. 425-156.000.

Brown, Harold E.: *See—*
Stephens, Thomas S.; Saldana, Guadalupe; and Brown, Harold E., 3,787,589.

Brown, Howard G.: *See—*
Albrecht, Clifford C.; and Brown, Howard G., 3,786,841.

Brown, Thomas A.; and Huber, Joseph B., to Kennametal Inc. Forming roll, especially for rod mills and the like. 3,786,546, Cl. 29-125.000.

Brown, Wayne; Fabere, Raymond W.; Grant, Gerald E.; and Sons, Charles C., to Caterpillar Tractor Company. Deflector ring for tire. 3,786,848, Cl. 152-209.00r.

Bruce, William P., to American Home Products Corporation. N-substituted -alpha, alpha, alpha-triflu oro-m-toluamides. 3,787,419, Cl. 260-293.770.

Bruen, Charles Patrick; and Wamser, Christian Albert, to Allied Chemical Corporation. Process for recovering chromium values from chrome ore. 3,787,555, Cl. 423-54.000.

Brunel, Roger L.; Fannon, Robert D.; and Legue, Ronald L., to Klenco Corporation. Overhead rail cleaner and oiler. 3,786,779, Cl. 118-4.000.

Brunetti, Heimo: *See—*

Schmidt, Andreas; Schwarzenbach, Kurt; and Brunetti, Heimo, 3,787,540.

Brunnee, Curt; and Bultemann, Hans-Joachim. Method for analysis by producing a mass spectrum by mass separation in a magnetic sector field of a mass spectrometer utilizing ionization of a sample substance by electron bombardment. 3,787,681, Cl. 250-41.9sb.

Bryant, Richard W.: *See—*
Allen, Charles A.; Bryant, Richard W.; Delaney, Thomas J.; Dhaka, Vir A.; Meade, Robert M.; and Wharmby, James D., 3,787,837.

Bryson, Wilmer G., Jr.; Lyle, Donald D.; and Wilda, Jack S., to Banner Industries, Inc. Blender with integral intensifier. 3,787,035, Cl. 259-16.000.

Buchanan, James B., to Du Pont de Nemours, E. I., and Company. Preparation of thiolhydroxamate esters from nitroalkanes. 3,787,470, Cl. 260-453.00r.

Buchel, Karl Heinz: *See—*
Draber, Wilfried; Buchel, Karl Heinz; Regel, Erik; and Plempel, Manfred, 3,787,415.

Bucher, Bernard Philippe: *See—*
Carron, Claude Louis Clement; Bucher, Bernard Philippe; and Jullien, Alexandra Francine, 3,787,436.

Bucher, David Hoffer; Christie, Craig Eugene; and Rasmussen, Don J., to Deere & Company. Tractor roll-over protective frame. 3,787,085, Cl. 296-28.00c.

Buchner, Werner: *See—*
Lucking, Hans Joachim; Noll, Walter; Buchner, Werner; Friederich, Klaus; and Niederprum, Hans, 3,787,467.

Buehler, Walter E.; and Lunden, Clarence D., to Boeing Company, The. Airborne radar instrument landing system. 3,787,841, Cl. 343-5.01s.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,787,174.

Bullard, Russell H.: *See—*
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Bultemann, Hans-Joachim: *See—*
Brunnee, Curt; and Bultemann, Hans-Joachim, 3,787,681.

Bunk, Albert R.: *See—*
Berry, David A.; Bunk, Albert R.; Halbrook, Noah J.; and Lawrence, Ray V., 3,787,342.

Burge, Harland L., Jr.: *See—*
Koppang, Richard R.; and Burge, Harland L., Jr., 3,787,168.

Burgess, Brian; and Thorp, Geoffrey Philip, to Imperial Industries (Kynoch) Limited. Control systems for rocket motors. 3,786,993, Cl. 239-265.190.

Burgess, William R.: *See—*
Wright, Archibald N.; Burgess, William R.; and Wilkos, Edward V., 3,787,382.

Burgin, Gerard. Carrier structure particularly for office equipment assembly. 3,786,934, Cl. 211-182.000.

Burns, Joseph P.; Feltzin, Joseph; and Kuehn, Erich, to ICI America Inc. Non-linear polyesters from a dicarboxylic acid etherified diphenol and an alkoxylated polyhydroxy compound. 3,787,526, Cl. 260-860.000.

Burr, Alan Carleton, to Howe Folding Furniture, Incorporated. Carrel construction. 3,786,765, Cl. 108-60.000.

Burr, Alan Carleton, to Howe Felding Furniture, Incorporated. Pin for interconnecting two parts of a knockdown assembly. 3,787,134, Cl. 403-408.000.

Burroughs Corporation: *See—*
Hauck, Erwin A.; Lyle, Don M.; and Wollum, James E., 3,787,816.
Wiggins, Gerald N.; and Rogers, Jerome S., 3,787,810.

Burt Machine Company, Incorporated, mesne: *See—*
Neer, Clifford H., 3,787,267.

Burton, Gardner T., to Radio Corporation of America. Optical recorder with intensity control. 3,787,887, Cl. 346-108.000.

Busch, John E., to GTE Automatic Electric Laboratories Incorporated. Multiplexing arrangement for a communication switching system. 3,787,633, Cl. 179-18.00j.

Bush, Stanley Edward; and Roberge, Kenneth Joseph, to Bell Telephone Laboratories, Incorporated. Key telephone intercom circuit. 3,787,640, Cl. 179-99.000.

Busian, Vincent V., to General Electric Company. Method for use in manufacturing dynamolectric machine. 3,786,561, Cl. 29-598.000.

Busink, Hendrik, to N.V. Hollandse Signaalapparaten. Device for the processing of digital symbol data for the purpose of displaying text on a television monitor. 3,787,819, Cl. 340-172.500.

Bussman, Dale R.; Bell, Frederick K.; and Filsinger, David E., to National Cash Register Company, The. Method and apparatus for breaking semiconductor wafers. 3,786,973, Cl. 225-2.000.

Buten, Norman: *See—*
Catalano, Paul D.; Buten, Norman; Eash, George H.; and Emanuel, Frank V., 3,787,114.

Buthe, Theo; Kugler, Manfred; and Rheinl, Lohmar, to Wallerscheild, Jean, GmbH, mesne. Alarm device on a clutch. 3,786,776, Cl. 116-67.00r.

Butler, Claude D.: *See—*
Kennedy, Carl D.; Butler, Claude D.; Krehbiel, Delmar D.; and Nicks, Gene E., 3,787,441.

Butler, Walter J.: *See—*
Puckette, Charles M.; Smith, Donald A.; and Butler, Walter J., 3,787,852.

Buys, Pieter; and Sonneborn, Lambertus, to Applied Power Industries, Inc. Vehicle having tiltable cabin and actuating device therefor. 3,787,087, Cl. 296-28.00c.

Cabell, Douglas N., to Ronson Corporation. Safety mechanism to prevent shaft coupling when blades are exposed in a blender. 3,786,999, Cl. 241-282.100.

Cailliot, Serge. Tape recorder utilizing resilient tape and cartridge having no moving parts. 3,787,057, Cl. 274-4.000.

Calcagno, Benedetto: *See—*
Piccolo, Luigi; Calcagno, Benedetto; and Ghirga, Marcello, 3,787,556.

Cam Industries, Inc.: *See—*
Bennett, Charles D., 3,787,729.

Camara, Elias Humberto: *See—*
Fleming, Donald Kingsley; Randhava, Sarabjit Singh; and Camara, Elias Humberto, 3,787,468.

Camco, Incorporated: *See—*
Tausch, Gilbert H., 3,786,863.
Tausch, Gilbert H.; and Watkins, Fred E., 3,786,865.
Tausch, Gilbert H.; and Watkins, Fred E., 3,786,866.
Tausch, Gilbert H.; Watkins, Fred E.; and Dietz, William H., 3,786,867.

Cammack, Thomas A.: *See—*
Donahue, William J.; Gratton, Peter D.; and Cammack, Thomas A., 3,786,754.

Camp, Jerome A. Remotely actuated release apparatus for ski bindings. 3,787,868, Cl. 343-225.00r.

Campbell, Donald J., to Baldin, D. H., Company. Rhythmic interpolators. 3,787,601, Cl. 84-1.030.

Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Her Majesty, the Queen, in right of: *See—*
Cote, Paul; and Roy, Charles A., 3,787,770.

Canadian Patents and Development, Limited: *See—*
Astill, Cyril J., 3,787,060.

Cann, Lyle L., to Chemetron Corporation. Apparatus for making compacted pellets of solid phase carbon dioxide. 3,786,645, Cl. 62-35.000.

Canon Kabushiki Kaisha: *See—*
Ito, Tadashi; and Sorimachi, Kanehiro, 3,787,108.

Cantrell, Audrey M. Apparatus and method for treating hair. 3,786,819, Cl. 132-9.000.

Carbonnel, Henry; and Borie, Robert, to Gronpement Atomique Alsacienne Atlantique. Immersion pump for pumping corrosive liquid metals. 3,787,143, Cl. 417-50.000.

Carbrey, Robert Lawrence, to Bell Telephone Laboratories, Incorporated. Time division communication system. 3,787,630, Cl. 179-15.0at.

Carini, Francis F.; and Abbott, Steven R., to Essex International. Insulated cable with sheath of controlled peel strength and method. 3,787,255, Cl. 156-51.000.

Carini, Raymond N.: *See—*
Scheppe, John J.; and Carini, Raymond N., 3,786,573.

Carissimi, Vincent L.; and Kress, George H., to Harvey Hubbell, Incorporated. Heavy duty plug. 3,787,798, Cl. 339-107.000.

Carlson, Robert Edward, to THW Inc. Stack-up assembly. 3,787,151, Cl. 418-133.000.

Carmelite, Donald D.; Kramer, Morton; and Lee, Gim F., Jr., to General Electric Company. Polyphenylene ether compositions. 3,787,532, Cl. 260-876.00r.

Carolina Narrow Fabric Company: *See—*
Nisbet, John L.; and Woodall, Hubert C., Jr., 3,787,272.

Caron, Joseph Adalbert. Vehicule vacuum chamber leak testing device. 3,786,671, Cl. 73-40.000.

Carre, Rene; Deauviala, Jean-Pierre; and Paille, Jean, to Agence Nationale de Valorisation de la Recherche (Anvar). Electrical filters enabling independent control of resonance of transition frequency and of band-pass, especially for speech synthesizers. 3787,778, Cl. 330-86.000.

Carron, Claude Louis Clement; Bucher, Bernard Philippe; and Jullien, Alexandra Francine, to Synthelabo S.A. 2-(Diphenyl amino-alkyl amino)-2-imidazolines. 3,787,436, Cl. 260-309.600.

Carson, William S.: *See—*
Riblett, Edward L., 3,786,575.

Cascade Corporation: *See—*
Faust, Donald M., 3,786,937.

Casensky, Bohuslav; Machacek, Jiri; and Vit, Jaroslav. Method of producing sodium aluminum hydrides. 3,787,450, Cl. 260-345.900.

Cash Register Company: *See—*
Roberts, Donald Lee, 3,787,210.

Cassill, William Guy, to Mead Corporation, The. Deflection electrode assembly for a jet drop recorder. 3,787,883, Cl. 346-75.000

Castanis, George, to Questor Corporation. Educational toy for the teaching of numerical recognition. 3,787,599, Cl. 35-31.00r.

Castellanos, Rafael A.: *See—*
Borger, Jurgen Herman; and Castellanos, Rafael A., 3,787,791.

Catalano, Paul D.; Buten, Norman; Eash, George H.; and Emanuel, Frank V., to Retention Communication Systems, Inc. Audio-visual system. 3,787,114, Cl. 352-31.000.

Catalyst Services, Inc.: *See—*
Kennedy, Alvin B., Jr., 3,787,183.

Caterpillar Tractor Company: *See—*
Berg, Lawrence F., 3,786,827.
Brown, Wayne; Fabere, Raymond W.; Grant, Gerald E.; and Sons, Charles C., 3,786,848.

Cath, Pieter B.; and Angeline, Gary E., to Keithley Instruments, Inc. High speed current amplifier. 3,787,776, Cl. 330-2.000.

Cationic Corporation: *See—*
Senior, Franklin C.; and MacGregor, Douglas, 3,787,306.

Cato, Joseph L.; and Correia, Theophilo A. Apparatus for indicating when a roll-off container is filled with compacted refuse. 3,787,830, Cl. 340-246.000.

Cavitt, Stanley Bruce, to Jefferson Chemical Company, Inc. Silicon containing molybdenum catalysts. 3,787,329, Cl. 252-431.00r.

Ceiko Ceiki Co., Ltd.: *See—*
Wada, Tokio, 3,787,266.

Celanese Corporation: *See—*
McGinnis, Paul H.; McLaughlin, William D., Jr.; and Swader, Robert E., 3,787,265.
Vogelfanger, Elliot A.; and Markham, Richard L., 3,787,551.

Celotex Corporation, The: *See—*
Kasprzak, David P., 3,786,603.
Wilkin, Joseph D., 3,786,602.

Ceskoslorenska akademie ved: *See—*
Dolejs, Ladislav; Beran, Pavel; Slama, Karel; and Sorm, Frantisek, 3,787,478.

Cevasco, Francis M.: *See—*
Christians, John A.; and Cevasco, Francis M., 3,786,525.

Chabala, Leonard V.; and Evans, David M., to B & C Electric Company. High voltage switch with high current closing contacts. 3,787,651, Cl. 200-146.00r.

Chance, A. B., Company: *See—*
Little, Jess C., 3,786,554.

Chandler, Wesley M.; Heuser, Paul F.; and Juba, Bernard T., to Wilbert, Inc. Burial vaults. 3,787,545, Cl. 264-135.000.

Chang, Jaw-King: *See—*
Folkers, Karl; Chang, Jaw-King; and Sievertsson, Hans, 3,787,385.

Chang, Yun Feng: *See—*
Labana, Santokh S.; and Chang, Yun Feng, 3,787,340.

Chapman, Harold Sherman. Dual concentric drillpipe. 3,786,878, Cl. 175-320.000.

Charlton, Donald A.; and Ajioka, James S., to Hughes Aircraft Company. Integrated beacon antenna polarization switch. 3,787,869, Cl. 343-756.000.

Charter Manufacturing Company, Inc.: *See—*
Eade, Maurice J.; and Mellowes, Charles N., 3,786,797.

Chase, Charles Peter: *See—*
Rohrbaugh, Donald Gene; Petersen, Everett James, Jr.; and Chase, Charles Peter, 3,787,185.

Chasson, Leon H., to Atmospheric Sciences, Incorporated. Automatic system for measuring selected dimensions. 3,787,700, Cl. 250-219.0th.

Chauncey, Edward W. Trailer hitch with auxiliary safety connections. 3,787,069, Cl. 280-486.000.

Cheetham, John Laurence, to Imperial Chemical Industries, Limited. Conjugate filaments apparatus. 3,787,162, Cl. 425-463.000.

Chemetron Corporation: *See—*
Cann, Lyle L., 3,786,645.

Cherdron, Harald: *See—*
Bohn, Lothar; Cherdron, Harald; Fleissner, Manfred; and Herwig, Walter, 3,787,530.

Cheskis, Harvey P.: *See—*
Setzer, William C.; Cheskis, Harvey P.; and Winter, Joseph, 3,787,248.

Chiariello, Ned. Collapsible table. 3,786,766, Cl. 108-115.000.

Chicago Bridge & Iron Company: *See—*
Anderson, Dale R.; and Grubbs, Conway E., 3,787,655.

Chin, William Benedict, to International Business Machines Corporation. Field-effect transistor logic circuit. 3,787,736, Cl. 307-205.000.

Chlanda, Frederick P.; and Liu, Kang-Jen, to Allied Chemical Corporation. Production of HF from fluorine by-products. 3,787,304, Cl. 204-180.00p.

Choi, Sam Kwon: *See—*
Park, Joseph D.; and Choi, Sam Kwon, 3,787,461.

Christena, Ray C.; Johnston, Earnest L.; and Whobrey, Ronald W., to Vulcan Materials Company. Polyesteramides prepared by reacting beta-propiolactone with an aziridine salt, a polycarboxylic acid, and a polyhydric alcohol. 3,787,282, Cl. 161-195.000.

Christeson, John H.: *See—*
Pray, Lester W.; Christeson, John H.; Prlston, Frederick A.; Sheron, Herman D.; Drake, William H.; and Anderson, Gordon C., 3,786,621.

Christians, John A.; and Cevasco, Francis M., to United States of America, Army. Transportable mooring body assembly. 3,786,525, Cl. 6-1-72.

Christie, Craig Eugene: *See—*
Bucher, David Hoffer; Christie, Craig Eugene; and Rasmussen, Don J., 3,787,085.

Church, Donald E., to Avco Corporation. Tire pressure warning apparatus. 3,787,806, Cl. 340-58.000.

Church, Nathan Lewis, to International Nickel Company, Inc., The. Forging metal powders. 3,787,205, Cl. 75-226.000.

Ciba-Geigy AG: *See—*
Eigenmann, Gottfried; Kaiser, Leo E.; and Nothiger, Otto, 3,787,182.
Piller, Bernhard, 3,787,215.
Porret, Daniel; and Fatzer, Willy, 3,787,405.
Thaddey, Kurt, 3,787,701.
Ulrich, Paul; Max, Basel; Kugler, Fritz; and Jost, Max, 3,787,406.
Wegmuller, Hans; and Kleemann, Alois, 3,787,180.

Ciba-Geigy Corporation: *See—*
Dellian, Kurt A.; and Lee, Samuel, 3,787,181.
Dietrich, Henri; and Lehmann, Claude, 3,787,574.
Gosteli, Jacques, 3,787,444.
Leumann, Ernst; and Lehmann, Hans, 3,787,452.
Linhart, Helmut; and Mueller, Helmut, 3,787,355.
Schmidt, Andreas; Schwarzenbach, Kurt; and Brunetti, Heimo, 3,787,540.

Ciccone, Thomas Q.; Hare, George F.; and Nimylowycz, Osyp, to United States of America, Army. Cartridge ignition system. 3,786,761, Cl. 102-45.000.

Ciszewski, Raymond S., to Western Electric Company, Incorporated. Method of fabricating a bobbin and core assembly. 3,786,562, Cl. 29-602.000.

Cities Service Company: *See—*
Heller, George L.; Eckert, Frank J.; De Land, Charles L.; and Dingman, Robert W., 3,787,562.
Topcik, Barry, 3,787,221.

Clark, Delia Margaret: *See—*
Wyatt, Derek Gerald; Clark, Delia Margaret; and Warne, Michael Anthony, 3,786,680.

Clark Equipment Company: *See—*
Cosby, Henry L., 3,787,086.

Clark, James R.; and Gearheard, Larry P., to Seattle Manufacturing Corporation. Adjustable crampons. 3,786,579, Cl. 36-7.600.

Clark, John B.: *See—*
Muffat, Donald L.; Clark, John B.; and Lovell, Lyle M., 3,787,189.

Clark, Thomas A.: *See—*
Phillips, John J.; and Clark, Thomas A., 3,787,011.

Clem, Chesley D., to Virginia Amusement Company. Carrousel-type amusement device. 3,787,046, Cl. 272-29.000.

Clemar Manufacturing Corporation: *See—*
Bayer, Donald R.; Ritchie, Lewis M.; and Bivens, Jon A., 3,787,728.

Clippard Instrument Laboratory, Inc.: *See—*
Clippard, Wm. L., III, 3,786,831.

Clippard, Wm. L., III, to Clippard Instrument Laboratory, Inc. Valve with modular manifold body. 3,786,831, Cl. 137-269.000.

Coackley, Robert, to Hewlett-Packard Ltd. Apparatus for measuring conversion of amplitude modulation to phase modulation. 3,787,763, Cl. 324-57.00r.

Coal Industry (Patents) Limited: *See—*
Robinson, Joseph Gordon; and Wise, William Sydney, 3,787,343.

Coanda, Henri, to Institutul Pentru Creatic Stiintifica Si Technica. System for pneumatically advancing a container within a duct. 3,787,006, Cl. 243-6.000.

Coburn, Theodore Robert: *See—*
Hyatt, Frederick; and Coburn, Theodore Robert, 3,786,706.

Coca-Cola Company, The: *See—*
Craft, James Pressley, III, 3,786,947.

Coe, Ronald J., to SCI Systems, Inc. Ground fault-sensitive detector and circuit breaker device. 3,787,709, Cl. 317-18.00d.

Cogar Corporation: *See—*
Allen, Charles A.; Bryant, Richard W.; Delaney, Thomas J.; Dhaka, Vir A.; Meade, Robert M.; and Wharmby, James D., 3,787,837.

Coilform Company, Inc.: *See—*
McFarlane, Leroy F., 3,787,799.

Colby, Harold S.; and Landry, Raymond H., to Emhart Corporation. Insulated stapling device. 3,787,608, Cl. 174-159.000.

Colchester, John Edward; and Blundell, Thomas, to Imperial Chemical Industries Limited. Manufacture of 1,1-disubstituted-4,4-bipyridylium salts. 3,787,426, Cl. 260-296.00d.

Cole, Alun John; Cotton, John Michael; and Cosserat, David Cockburn, to Plessey Handel und Investments A.G. Data processing devices using capability registers. 3,787,813, Cl. 340-172.500.

Cole, Eugene A.: *See—*
Behunin, Gage B.; Cole, Eugene A.; and Staadt, Charles R., 3,786,966.

Cole, John Wayne: *See—*
Flouret, George Rogelio; and Cole, John Wayne, 3,787,386.

Coleman, John R., Jr., to Marathon Oil Company. Solids-liquid separator. 3,787,318, Cl. 210-65.000.

Collet, Peter Jacobus, to Nederlandse Organisatie Voor Tolgepast Natuurwetenschappelijk Onderjoek ten Behoeve van Nijverheid, Handel en Verkeer. Refrigerating plant. 3,786,646, Cl. 62-115.000.

Collet, Peter Jacobus, to Nederlandse Organisatie Voor Toegepast. Centrifugal compressor meter. 3,786,647, Cl. 62-123.000.

Collins, Paul W.; and Pappo, Raphael, to Searle, G. D., & Co. Manufacture of 2-(3-hydroxy-3-optionally alkylated-1-alkynyl)-3-hydroxy-5-oxocyclopent-1-enealkanoic acids and esters. 3,787,449, Cl. 260-345.700.

Collins Radio Company: *See—*
Bass, Larry F., 3,787,785.

Colln, Reimer; Hammann, Ingeborg; Unterstenhafer, Gunter; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Thionothiolphosphoric acid O,S-diester amides. 3,787,539, Cl. 260-959.000.

Colman, John M.: *See—*
Hagopian, Nubar D.; and Colman, John M., 3,786,802.

Combrinck, Hendrik Johannes Van Jaarsveldt. Mechanical emergency central switch assembly for motor vehicles. 3,787,805, Cl. 340-52.00h.

Combustion Engineering, Inc.: *See—*
Anthony, Andrew James, 3,787,286.

Commissariat a l'Energie Atomique: *See—*
Blanchet, Francis; and Sauron, Georges, 3,787,824.
Espie, Jean Yves; Jouan, Claude; and Koehly, Gerard, 3,787,553.
Grunberg, Georges; Melnick, Igor; and Lazzari, Jean Pierre, 3,787,237.
Hirco, Bernard, 3,787,120.

Compagnie d'Electronicque et de Piezo-Electricite-C.E.P.E.: *See—*
Gibert, Guy; and Vidal, Pierre, 3,787,743.

Comstock, Allen L.: *See—*
Hastings, Charles E.; Rounion, William A.; Comstock, Allen L.; and Bradbury, Joseph T., 3,787,844.

Concast AG: *See—*
Nishikawa, Tomio, 3,786,856.

Coneo Inc.: *See—*
Hathcock, James S., Jr., 3,786,929.

Conger, Robert P.; and Varadhachary, Seevaram N., to Congoleum Industries, Inc. Resinous product having sharp color definitions therein. 3,787,280, Cl. 161-168.000.

Congoleum Industries, Inc.: *See—*
Conger, Robert P.; and Varadhachary, Seevaram N., 3,787,280.

Conlon, Joseph M.: *See—*
Lowy, George W.; Conlon, Joseph M.; and Marcus, Byron E., 3,787,121.

Constructions Mills K: *See—*
Coppel, Georges, 3,786,943.

Container Corporation of America: *See—*
Potts, Herbert M.; and Trutna, Maynard A., 3,786,915.

Continental Can Company, Inc.: *See—*
Hilgenbrink, John T., 3,786,957.
Roth, Donald J., 3,786,662.

Continental Oil Company: *See—*
Kennedy, Carl D.; Butler, Claude D.; Krehbiel, Delmar D.; and Nicks, Gene E., 3,787,441.

Conversion Chemical Corporation: *See—*
Beckwith, Merton M.; and Hsu, Grace F., 3,787,297.

Cook, Harold D., to Teletype Corporation. Cathode ray tube display device including test probe adapter. 3,787,618, Cl. 178-6.800.

Cook, Melvin A.; Udy, Lex L.; Hagmann, Mark J.; and Jessop, Harvey A., to Ireco Chemicals. Explosive compositions containing calcium netrate. 3,787,254, Cl. 149-60.000.

Cook, William R.: *See—*
Sheeley, Donald R.; Rion, James H.; Cook, William R.; and Biggs, William A., Jr., 3,787,283.

Cooper, Lloyd R., to Heppenstall Company. Production of large steel ingots using an electrode remelting hot top practice. 3,786,853, Cl. 164-52.000.

Cooper, Philip G., to Kaiser Aerospace & Electronics Corporation. System for deriving azimuth steering commands from automatic direction finding equipment. 3,787,809, Cl. 343-117.00r.

Cooper, Wayne E.: *See—*
Rakes, James L.; and Cooper, Wayne E., 3,786,982.

Coppel, Georges, to Constructions Mills K. Centralised control for an automatic system of handling pallets. 3,786,943, Cl. 214-16.40a.

Copper Range Company: *See—*
Finlay, Walter L.; Nayar, Harbhajan S.; and Hay, Donald A., 3,787,200.

Corkum, James L.; Schoepflin, David; and Taylor, Paul A., to Alden Self-Transit Systems Corporation. Transportation system electrical power distribution. 3,786,762, Cl. 104-148.00r.

Corning Glass Works: *See—*
Kauffman, James F., 3,787,872.

Correia, Theophilo A.: *See—*
Cato, Joseph L.; and Correia, Theophilo A., 3,787,830.

Cosby, Henry L., to Clark Equipment Company. Adjustable seat for an industrial vehicle. 3,787,086, Cl. 296-65.00r.

Cosserat, David Cockburn: *See—*
Arnold, John Spencer; Beck, George Morland; Boom, Roger John; Cosserat, David Cockburn; Hodges, Kenneth James Hamer; Sandeman, Theodor Duncan; Williams, Roger Morley; and O'-Halloran, Michael, 3,787,818.
Cole, Alun John; Cotton, John Michael; and Cosserat, David Cockburn, 3,787,813.

Costa, Georges, to Paillard S.A. Device for the individual adjustment of the striking force in a typewriter. 3,786,905, Cl. 197-17.000.

Coston, Malcom M.: *See—*
Vlazny, Joseph J.; and Coston, Malcom M., 3,786,935.

Cote, Paul; and Roy, Charles A., to Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Her Majesty, the Queen, in right of. Method and apparatus for detecting a projectile leaving the barrel of a gun. 3,787,770 Cl. 324-178.000.

Cotton, John Michael: *See—*
Cole, Alun John; Cotton, John Michael; and Cosserat, David Cockburn, 3,787,813.

Couch, Richard W., Jr., to Hypertherm, Incorporated. Water-scrubber cutting table. 3,787,247, Cl. 148-9.00r.

Coulombe, Lionel J., to Singer Company, The. Pattern selection system. 3,786,769, Cl. 112-158.00a.

Courtin, Erich: *See—*
Tietze, Ulrich; Courtin, Erich; and Traub, Stefan, 3,787,774.

Courtney-Pratt, Jeofry S.; and Schmidt, Alfred C., Jr., to Bell Telephone Laboratories, Incorporated. Fiber optic devices and method for making same. 3,786,840, Cl. 139-11.000.

Cover, Richard J.: *See—*
Korchynsky, Michael; Bell, John R.; and Cover, Richard J., 3,787,250.

Cowpland, Michael C. J.; and Zambakoglu, Feyyaz I., to Microsystems International Limited. Coupler circuit for telephone networks and the like. 3,787,739, Cl. 307-255.000.

Cox Manufacturing Co., Inc.: *See—*
Cox, Paul D., 3,786,799.

Cox, Paul D., to Cox Manufacturing Co., Inc. Pulse relief damper. 3,786,799, Cl. 128-91.00a.

Craft, James Pressley, III, to Coca-Cola Company, The. Movable shelf apparatus. 3,786,947, Cl. 214-75.00r.

Cragon, Harvey; and Logan, Russell H., to Texas Instruments, Incorporated. Coherent digital radar target signal enhancement. 3,787,855, Cl. 343-17.10r.

Crane-Veyor Corporation: *See—*
Snyder, Donald E.; and Batcheller, Roy W., 3,787,033.

Crawford, Donald. Artist's paint box. 3,786,913, Cl. 206-1.800.

Crawford Fitting Company: *See—*
Spontelli, Leonard P., 3,786,677.

Crees, Silas Ray. Cable bending apparatus. 3,786,668, Cl. 72-388.000.

Crescentini, Lamberto; and Wells, Rodney Lee, to Allied Chemical Corporation. Antistatic polyamide fiber containing sulfonic acid polyether reaction product. 3,787,523, Cl. 260-857.0pg.

Crescentini, Lamberto; Wells, Rodney Lee; Lazarus, Stanley David; and Weedon, Gene Clyde, to Allied Chemical Corporation. Antistatic polyamide fiber containing sulfonic acid polyether reaction product. 3,787,524, Cl. 260-857.0pg.

Creusot-Loire: *See—*
Lhenry, Bernard, 3,786,824.

Creuzet, Robert Armand. Hot extrusion machine. 3,786,665, Cl. 72-259.000.

Crites, Nelson A., to Battelle Memorial Institute. Ratigue indication. 3,786,679, Cl. 73-88.50r.

Croce, Nicola. Device for releasably connecting a sinker to a line. 3,786,595, Cl. 43-44.870.

Cromp, Theodore O., to Hunter Engineering Company, Inc. Closed loop, inert atmosphere, paint line oven heat. 3,787,171, Cl. 432-72.000.

Crown Zellerbach Corporation: *See—*
Nowotny, Kurt A., 3,787,256.

Crum, Robert L.; and Patel, Ishwarlal P., to Allis-Chalmers Corporation. Loader linkage. 3,786,953, Cl. 214-776.000.

Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, to Laporte Chemicals Limited. Peroxygen compounds. 3,787,503, Cl. 260-610.00r.

Cullis, Herbert M.: *See—*
Lowy, George W.; Priarone, Paul; and Cullis, Herbert M., 3,787,124.

Culver, Richard B., to Dresser Industries, Inc. Method and apparatus for logging well boreholes with gamma rays from the inelastic scattering of fast neutrons. 3,787,686, Cl. 250-83.30r.

Cunningham, James A. Electrical isolation of circuit components of integrated circuits. 3,786,560, Cl. 29-577.000.

Cunningham, James A. Integrated circuit structure having electrically isolated circuit components. 3,787,710, Cl. 317-101.00a.

Curnow, John W.; and Nowicki, Harry J., to Sperry Rand Corporation. Power transmission. 3,787,027, Cl. 251-63.000.

Currie, Richard W.; and Peacher, Teddy J., to United States of America, Army. Adaptive threshold unit. 3,787,668, Cl. 235-152.000.

Customcraft Nails, Inc.: *See—*
Noskin, Harold P., 3,786,821.

Cutler, Richard, to Gottfried Reuter GmbH. Ball joint. 3,787,127, Cl. 403-133.000.

Cyba, Henryk A., to Universal Oil Products Company. Stabilization of solid polymers with a bis-(N,N-dihydrocarbyl-aminoalkyl) ether. 3,787,354, Cl. 260-45.90r.

Cyba, Henryk A., to Universal Oil Products Company. N-oxyalkyl-N'-hydrocarbyl-hexahydropyrimidines. 3,787,416, Cl. 260-251.00r.

Cyclops Corporation: *See—*
Mueller, Charles P.; and Ecer, Gunes M., 3,787,202.

Dahlen, Burton L.; Mosly, Wilbur C., Jr.; Smith, Paul K.; and Albenesius, Edward L., to United States of America, Atomic Energy Commission. Californium-palladium metal neutron source material. 3,787,321, Cl. 252-301.10r.

Dahlquist, Carl A.; and Kolpe, Vasant V., to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesives comprising a block copolymer and a tackifier. 3,787,531, Cl. 260-876.00b.

Daigle, Donald J.; Drake, George L., Jr.; and Reeves, Wilson A., to United States of America, Agriculture. Phosphorus containing aromatic polymers and process for producing flame resistant textiles. 3,787,360, Cl. 260-47.00p.

Daigle, Jack R.; and Habegger, James D., to Rapistan, Incorporated. Apparatus and method for applying labels to articles in a warehouse system. 3,786,944, Cl. 214-16.40a.

Dailey, Louis E., Jr. Apparatus for tobacco harvesting. 3,786,941, Cl. 214-83.100.

Daimler-Benz Aktiengesellschaft: *See—*
Sommerfeld, Karl; and Zelldann, Herbert, 3,786,618.

Dalebout, Melvin W., to Tanner, Gold & Trask. Inner boot and method for forming the same. 3,786,580, Cl. 36-2.5al.

Damisch, Russell: *See—*
Wingerd, Winston Harold; Damisch, Russell; and Bozzi, Marshall, 3,787,216.

Dane, Ernest B., Jr. Dry sail marina. 3,786,942, Cl. 214-16.40a.

Dane, Oscar; Beers, Ronald Wentworth; and Levey, Gustave Stanley, to Levey, Gustave S., Trustee. Pump for zinc-rich materials or the like. 3,787,149, Cl. 417-554.000.

Dangay, Catherine: *See—*
Dangay, Jean Louis; Dangay, Philippe; and Dangay, Catherine, 3,786,567.

Dangay, Jean Louis; deceased (by Godard, Regine); Dangay, Philippe; and Dangay, Catherine. Apparatus for drawing the isometric perspective view of an object. 3,786,567, Cl. 33-23.00b.

Dangay, Philippe: *See—*
Dangay, Jean Louis; Dangay, Philippe; and Dangay, Catherine, 3,786,567.

Daniel, Brian Percy. Pipe couplings. 3,787,080, Cl. 285-341.000.

Daniels, Peter; and Sim, Alexander Kennedy, to Inveresk Research International. Cross-linked polymers. 3,787,474, Cl. 260-459.000.

Danly Machine Corporation: *See—*
Mehring, Lucien L., 3,786,846.

Danzer, Paul M. Intensity cursor for radar. 3,787,847, Cl. 343-7.300.

Dao, James; and Yew, Nelson C., to ETEC Corporation. Scanning electron microscope electron-optical column construction. 3,787,696, Cl. 250-311.000.

Darnbrough, Geoffrey: *See—*
Hutchinson, Peter; and Darnbrough, Geoffrey, 3,786,538.

David Kopf Systems: *See—*
Kopf, J. David, 3,787,148.

Davies, Robert H. Sundial. 3,786,570, Cl. 33-270.000.

Davis, Burns; and Kibler, Charles J., to Eastman Kodak Company. Polyisocyanate adducts. 3,787,469, Cl. 260-453.00a.

Davis, Dan Bryan, to Northern Electric Company Limited. Continuous soldering apparatus. 3,786,981, Cl. 228-4.000.

Davis, Lewis Kie, to Deere & Company. Trigger mechanism for fuel injection pump aneroid control. 3,786,794, Cl. 123-139.0st.

Davis, Randall Scott; and Isenberg, Don Lee, to Beckman Instruments, Inc. Method of producing dextranase. 3,787,289, Cl. 195-65.000.

Davis, Samuel L.: *See—*
Gregg, Jack C.; and Davis, Samuel L., 3,786,551.

Day, John H.: *See—*
Riblett, Edward L., 3,786,575.

Day, Wendall E. Temperature and humidity control and apparatus for residential buildings. 3,786,859, Cl. 165-21.000.

Dayton Manufacturing Company: *See—*
Materese, Vincent, 3,786,922.

Dayton Steel Foundry Company, The: *See—*
Walther, William D.; and Deregnaucourt, Robert A., 3,787,076.

De Boer, Harry F.; and Spowart, Joseph A. N., to Servicemaster Hospital Corporation. Laundry hamper stand. 3,787,072, Cl. 280-79.100.

De Geest, Wilfried Florent, to Agfa-Gevaert N.V. Apparatus for the control of charge on a moving web. 3,787,706, Cl. 317-2.00r.

De Jong, Nicolaas Johannes; and Middelkamp, Mannes Arie, to U.S. Philips Corporation. Coil former for a transformer. 3,787,792, Cl. 336-192.000.

De Jonge, Frederik Ate, to U.S. Philips Corporation. Magnetic domain store. 3,787,825, Cl. 340-174.0yc.

De Land, Charles L.: *See—*
Heller, George L.; Eckert, Frank J.; De Land, Charles L.; and Dingman, Robert W., 3,787,562.

De Marco, Michael, to Produits Chimiques Ugine Kuhlmann. Tri (isopropyl)phenyl phosphates. 3,787,537, Cl. 260-953.000.

De Morgan, Tita Zuccaro. Device for supporting and delivering containers in a controlled form. 3,786,958, Cl. 221-67.000.

De Santis, Urbano J.: *See—*
Snyder, Herbert C.; and De Santis, Urbano J., 3,787,197.

De Vines, Hollis L.: *See—*
Hofford, Thomas P.; and De Vines, Hollis L., 3,786,578.

De Vries, Adrian J.; and Rypkema, Jouke N., to Zenith Radio Corporation. Signal processing system for television receiver having acoustic surface wave devices for improved tuning and video demodulation. 3,787,612, Cl. 178-5.8af.

De Witt, Elmer J., to Goodrich, B. F., Company, The. Apparatus for conversion-controlled polymerization of monomeric materials in liquid media. 3,787,187, Cl. 23-285.000.

Deauviala, Jean-Pierre: *See—*
Carre, Rene; Deauviala, Jean-Pierre; and Paille, Jean, 3,787,778.

Debat, Jacques, to Institut de Recherches Chimiques et Biologiques Appliquee (I.R.C.E.B.A.). Halogenated benzylphenols having bacteriostatic activity. 3,787,507, Cl. 260-619.00a.

Debonte, Cornelius, Jr.: *See—*
Wahl, Eugene A.; Debonte, Cornelius, Jr.; and Winters, Ralph J., 3,786,961.

Deckert, Robert, to Sir Steak Machinery, Inc. Means for cutting and tenderizing meats. 3,786,536, Cl. 17-25.000.

Deere & Company: *See—*
Bucher, David Hoffer; Christie, Craig Eugene; and Rasmussen, Don J., 3,787,085.
Davis, Lewis Kie, 3,786,794.
Magnuson, Lee T.; and Kusko, Alexander, 3,787,723.
Rathe, Robert Allyn; and Miller, Lyle Eugene, 3,786,872.
Symonds, Dean Homer, 3,786,945.
Vogelaar, Bernard Francis; Doering, James Peter; and Pasturczak, Stanley, 3,786,891.

Defebvre, Andre; Leman, Gerard; and Pouliquen, Jean-Francois, to Etat Francais. Continuously variable ultrasonic delay line. 3,787,786, Cl. 333-30.00r.

Delaney, Thomas J.: *See—*
Allen, Charles A.; Bryant, Richard W.; Delaney, Thomas J.; Dhaka, Vir A.; Meade, Robert M.; and Wharmby, James D., 3,787,837.

Delaquila, Gary; and Bercier, John R., to Minnesota Mining and Manufacturing Company, mesne. Display sign structure. 3,786,585, Cl. 40-125.00h.

Delatorre, Leroy C.; and Rapson, William J., to Uson Corporation. Portable gas leak detector. 3,786,675, Cl. 73-27.00r.

Delay, Dennis G., to United States of America, Navy. Intensity control for light-emitting diode display. 3,787,752, Cl. 315-169.00r.

Deline, John W. Method of reducing emission of pollutants in exhaust gas from an internal combustion engine and material therefor. 3,787,328, Cl. 252-427.000.

Dellian, Kurt A.; and Lee, Samuel, to Ciba-Geigy Corporation. Dyeing synthetic hydrophobic fibers with lower alkyl biphenyl carriers. 3,787,181, Cl. 8-174.000.

Delro Inc., mesne: *See—*
Huffman, Lowell E., 3,786,924.

Deltrol Corporation: *See—*
Harris, John L., 3,787,789.

Demichelis, Jacques: *See—*
Jodet, Alain; Noret, Hubert; and Demichelis, Jacques, 3,786,874.

Denis, Jean Francois; Ozauba-Lyndis, Serge Yvan; Fremont, Maurice Henri Louis; Krajewski, Edward; and Marcel, Jean-Pierre Julien, to Societe Nationale Industrielle Aerospatiale. Apparatus for manufacturing sandwich panels. 3,787,657, Cl. 219-117.0hc.

Denison, Neil E.; and McCullough, Edward E. Powered ice cream dipper. 3,787,163, Cl. 425-280.000.

Dennewitz, Rolf Dieter; and Schmidt, Walter, to Loewe-Opta GmbH. Electronic flash unit with controlled light energy. 3,787,704, Cl. 315-241.00p.

Denzel, Theodor: *See—*
Hoehn, Hans; and Denzel, Theodor, 3,787,430.

DePriester, Donald Jack; Horney, David C.; and Mangels, Robert H. Hon Industries, Inc. Power driven material handling truck. 3,787,064, Cl. 280-93.000.

Deregnaucourt, Robert A.: *See—*
Walther, William D.; and Deregnaucourt, Robert A., 3,787,076.

Dereich, John E.; Gleeson, James E.; and Earle, Glenn J., to Robertson, H. H., Company. Military bomb and method of making same. 3,786,714, Cl. 86-23.000.

Deringer, Dewitt C., to Parker, Ben H., Jr. Method and apparatus for concentrating ore pulps. 3,786,919, Cl. 209-434.000.

Desoutter Brothers Limited: *See—*
States, Ronald Frederick, 3,786,845.

Deumu Deutsche Erzund Metall-Union Gesellschaft mit beschrankter Haftung: *See—*
Glatz, Horst, 3,786,610.

Deuringer, Rudolf; Ray, Robert A.; and Sternberg, James C., to Beckman Instruments, Inc. Liquid analysis apparatus. 3,787,291, Cl. 195-127.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Giesselmann, Gunter; Schwarze, Werner; and Weigert, Wolfgang, 3,787,472.
Koberstein, Edgar; and Lakatos, Eduard, 3,787,322.
Schwarze, Werner, 3,787,199.
Thiele, Kurt; and Von Bebenburg, Walter E., 3,787,429.

Dewitte, Maurice J.; and Wojciechowski, Gerald L., to GTE Automatic Electric Laboratories Incorporated. Logic detector apparatus. 3,787,735, Cl. 307-203.000.

Deyrup, Alden J., to Du Pont de Nemours, E. I., and Company. Chromium (III) compositions and their preparation. 3,787,326, Cl. 260-438.50r.

Dhaka, Vir A.: *See—*
Allen, Charles A.; Bryant, Richard W.; Delaney, Thomas J.; Dhaka, Vir A.; Meade, Robert M.; and Wharmby, James D., 3,787,837.

Diagrostic, Inc.: *See—*
Sartorius, Otto W., 3,786,801.

Diazit Company, Inc.: *See—*
Neeb, Robert P.; Patrick, Henry W.; and Mumford, Ray H., 3,786,736.

Dickerson, Richard T.: *See—*
Ungerug, Gary A.; Pews, R. Garth; and Dickerson, Richard T., 3,787,506.

Dickie, Ray A.; and Newman, Seymour, to Ford Motor Company. Acrylate polymer particles comprising a core, an outer shell, and an intermediate layer. 3,787,522, Cl. 260-836.000.

Dickmann, Heinz Hermann; Krattner, Richard; and Mobius, Hans-Dieter; deceased (by Diehnelt, Isolde Mobius Geb; executor), to UHU-Werk H.u.M. Fischer G.m.b.H. Stick for the application of adhesive to substrates. 3,787,345, Cl. 260-28.50r.

Dickmann, Heinz Hermann; and Krattner, Richard, to UHU-Werk H.u.M. Fischer G.m.b.H. Stick for the application of adhesive to substrates. 3,787,346, Cl. 260-28.50r.

Diebold Incorporated: *See—*
Barnett, Charles B.; and Ekama, Pieter J., 3,787,008.

Diehl, Henry T.; and Rouse, James D. Double ratchet wrench. 3,786,698, Cl. 81-57.390.

Diehnelt, Isolde Mobius Geb: *See—*
Dickmann, Heinz Hermann; Krattner, Richard; and Mobius, Hans-Dieter, 3,787,345.

Diersing, Raymond A., to Square D Company. Plug-on circuit breaker mounting device pluggable onto a bus bar stack for relatively large

plug-on circuit breakers and including means for mounting relatively small plugeon circuit breakers not pluggable onto th bus bar stack. 3,787,712, Cl. 317-119.000.

Diersing, Raymond A.; Morrill, Robert J.; and Stanback, Harris I., to Square D Company. Service section switchboard with horizontally extending bus bar stack and means for mounting some circuit breakers with load terminals facing vertical wiring trough andother circuit breakers with load terminals facing horizontal wiring trough. 3,787,713, Cl. 317-119.000.

Dietrich, Henri; and Lehmann, Claude, to Ciba-Geigy Corporation. P-aminoalkyl benzenesulfonamide derivatives for treating diabetes mellitus. 3,787,574, Cl. 424-266.000.

Dietz, Raymond Louis; and McFadden, Allan L., to Owens-Illinois, Inc. Zircon containing printing paste for overglaze coating of microelectronic circuits on ceramic substrates. 3,787,218, Cl. 106-39.500.

Dietz, William H.: *See—*
Tausch, Gilbert H.; Watkins, Fred E.; and Dietz, William H., 3,786,867.

Difazio, Joseph, to Acron Products Company. Cored insulated door. 3,786,609, Cl. 52-619.000.

Digital Equipment Corporation: *See—*
Schneider, Guenter E., 3,787,644.

Digital Scientific Corporation: *See—*
Vinson, Billy H., 3,787,821.

Dils, Eugene W., Jr.; Ward, Larry A.; and Ward, Robert A., to Garon Company. Fish feeding apparatus. 3,786,784, Cl. 119-51.00r.

Dimmig, Daniel Ashton: *See—*
Ferren, Richard Anthony; and Dimmig, Daniel Ashton, 3,787,379.

Dingman, Robert W.: *See—*
Heller, George L.; Eckert, Frank J.; De Land, Charles L.; and Dingman, Robert W., 3,787,562.

Director-General of Agency of Industrial Science and Technology: *See—*
Nishikawa, Shigeru; Akami, Hitoshi; and Shibuya, Atsuo, 3,786,987.

Dischler, Helmut, to Noropress GmbH Iressen und Presswerkzeuge & Co., KG. Spindle press. 3,786,743, Cl. 100-270.000.

Displaytek Corporation: *See—*
McCrady, John, 3,787,886.

Dixon, Lemuel Claude. Boot and shoe puller. 3,786,970, Cl. 223-15.000.

Dobinson, Frank; and Pelezo, Chris A., to Monsanto Company. N,N-dimethylacetamide solutions of polyhydrazides. 3,787,348, Cl. 260-32.6na.

Dodge, Robert J.; and Huffer, Wilson R., to Automatic Power Division. Navigational aid system. 3,787,867, Cl. 343-225.000.

Doering, James Peter: *See—*
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Foerster, Hubert; and Brauch, Ulrich, to Bosch, Robert, Fernsehanlagen GmbH. Method and apparatus for synchronizing a videosignal reproduced from a tape by means of a rotating head wheel. 3,787,615, Cl. 178-6.60f.

Folkers, Karl; Chang, Jaw-King; and Sievertsson, Hans. Synthetically produced tetrapeptide having the activity of the luteinizing hormone releasing hormone. 3,787,385, Cl. 260-112.500.

Folzenlogen, Robert G.; and Smith, James P., to Procter & Gamble Company, The. Processing of beans and peas by freeze drying. 3,787,595, Cl. 426-441.000.

Fontanella, John J.: *See—*
Andeen, Carl G.; Fontanella, John J.; and Schuele, Donald E., 3,787,764.

Fontani, Spartaco: *See—*
Peri, Cesare Augusto; Fontani, Spartaco; and Ladavas, Franco, 3,787,504.

Foote, Daniel J., to Master Lock Company. Hasp and staple assemblage. 3,787,082, Cl. 292-281.000.

Forbes, David K.: *See—*
Smiley, Vern N.; Lewis, Adolph L.; and Forbes, David K., 3,787,234.

Forbes, Hampton E., Jr., to Westvaco Corporation. Cutting and scoring die. 3,786,732, Cl. 93-58.300.

Ford Motor Company: *See—*
Dickie, Ray A.; and Newman, Seymour, 3,787,522.
Labana, Santokh S.; and Chang, Yun Feng, 3,787,340.
Labana, Santokh S.; and Theodore, Ares N., 3,787,520.
Labana, Santokh S.; and Golovoy, Amos, 3,787,521.

Foreman, Frederick Arthur: *See—*
Sachs, Kurt; Foreman, Frederick Arthur; and Barlow, John, 3,787,204.

Forlani, Franco: *See—*
Filippazzi, Franco; and Forlani, Franco, 3,787,252.

Foseco International, Limited: *See—*
Sharp, John David, 3,787,336.

Fossard, Hubert Rene Louis; and Joly, Henriette Josephine. Warning system and method. 3,786,628, Cl. 58-152.00b.

Foster, Silvers A.; and Smith, Charles F. Muffler. 3,786,896, Cl. 181-53.000.

Fowler, Daniel L.: *See—*
Habegger, James D.; Huttula, Andrew B.; Fowler, Daniel L.; and Schrader, James T., 3,786,939.

Fowler, Gerald: *See—*
Hemmings, Keith Reginald; and Fowler, Gerald, 3,787,130.

Francis, Philip L., to General Motors Corporation. Steering wheel and column interface seal. 3,787,075, Cl. 280-150.0ab.

Frankel, Edwin N., to United States of America, Agriculture. Selective hydroformylation of unsaturated fatty compounds. 3,787,459, Cl. 260-410.700.

Freeman, Frank George, to Lucas, Joseph, (Industries), Limited. Rotary hydraulic machines. 3,786,726, Cl. 91-492.000.

Freitag, Herbert, to Stabilus Industrie- und Handelsgesellschaft mbH. Supporting element of adjustable length. 3,787,019, Cl. 248-188.200.

Fremont, Maurice Henri Louis: *See—*
Denis, Jean Francois; Ozauba-Lyndis, Serge Yvan; Fremont, Maurice Henri Louis; Krajewski, Edward; and Marcel, Jean-Pierre Julien, 3,787,657.

Frenkel, Mark Isaakovich. Direct-flow cylindrical valve. 3,786,833, Cl. 137-512.160.

Frick Company: *See—*
Garland, Milton W., 3,786,834.

Fridenberg, Jerry T.: *See—*

Meyers, Laverne H.; Kagele, Frank L.; Trent, Edward J.; Fridenberg, Jerry T.; Alberty, Frederick J.; and Fitzgerald, Bloyce D., 3,787,660.

Fried, John H.; and Harrison, Ian T., to Syntex Corporation. 2-(6'-Methoxy-2'-naphthyl)propionic acid and -i-propanol derivatives having anti-inflammitory, analgesic and anti-pyretic activities. 3,787,580, Cl. 424-308.000.

Friederich, Klaus: *See—*
Lucking, Hans Joachim; Noll, Walter; Buchner, Werner; Friederich, Klaus; and Niederprum, Hans, 3,787,467.

Friedman, Robert L.; and Lieser, Zeev. Noise cancelling self mixing doppler radar. 3,787,854, Cl. 343-8.000.

Fritz, Erich; and Bostrowsky, Daniel, to Thomason-CSF. Adjustable wavelength optical source using the simulated emission effect. 3,787,779, Cl. 331-94.500.

Fronius, Sabine: *See—*
Passler, Helmar; Heger, Adolf; and Fronius, Sabine, 3,787,260.

Fruehauf, Waldo G., to General Signal Corporation. Hydraulic oscillator. 3,786,723, Cl. 91-284.000.

Frye, James A.; and Morton, Ralph B., to Boardman Company, The. Carbon black pelletizer. 3,787,161, Cl. 425-222.000.

Fuji Denki Seizo Kabushiki Kaisha: *See—*
Kawasaki, Kikuo, 3,787,648.

Fuji Photo Co., Ltd.: *See—*
Kitamoto, Tatsuji; Shimizu, Mahito; and Akashi, Goro, 3,787,564.

Fuji Photo Film Company, Ltd.: *See—*
Minagawa, Nobuhiko, 3,787,214.
Sato, Masamich; and Nabara, Akira, 3,787,873.

Fujii, Kyoichi: *See—*
Kagawa, Tsuneo; Fujii, Kyoichi; Tanaka, Masao; and Tanaka, Hiroshi, 3,787,466.

Fujii, Shozo, to Kabushiki Kaisha Fujii Kogyo. Muffling block. 3,786,898, Cl. 181-33.00g.

Fujisawa, Hideya: *See—*
Soda, Toshi; and Fujisawa, Hideya, 3,786,788.

Fujisawa, Yutaka: *See—*
Saito, Kimio; and Fujisawa, Yutaka, 3,786,855.

Fukazawa, Nobuo: *See—*
Aya, Hasahiro; Saito, Junichi; Fukazawa, Nobuo; Tamura, Tatsuo; Kurihara, Kazuo; and Norishima, Norihisa, 3,787,393.
Schrader, Gerhard; Eue, Ludwig; Hack, Helmuth; Hirane, Seiichi; Aya, Masahiro; Kishino, Shigeo; and Fukazawa, Nobuo, 3,787,538.

Fukuda, Kazuo: *See—*
Yamada, Keisho; Umemura, Sumio; Ohdan, Kyoji; Hidaka, Mikio; Bando, Yasuo; Fukuda, Kazuo; and Sawazi, Masao, 3,787,334.

Fulmini, Sergio: *See—*
Siclari, Francesco; Magnoni, Franco; and Fulmini, Sergio, 3,787,481.

Furuno Electric Company, Limited: *See—*
Kubota, Hiroshi; and Suzuki, Tomohiko, 3,787,845.

G & H Technology, Inc.: *See—*
Phillips, John J.; and Clark, Thomas A., 3,787,011.

Gabel, William A. Airboat. 3,786,774, Cl. 114-66.50r.

Gadefaix, Roger; and Klere, Jean, to Lever Brothers Company. Process for splitting soapstock and apparatus therefor. 3,787,460, Cl. 260-418.000.

Gaerttner, Martin R., to United States of America, Atomic Energy Commission. Two-dimensional coils for electromagnetic generation and detection of acoustic waves. 3,786,672, Cl. 73-67.05r.

GAF Corporation: *See—*
Randall, David I.; Vogel, Calvin; and Wynn, Robert W., 3,787,486.

Galbarzyk, Leslie L.; Ross, Irving D., Jr.; and Madland, Thorvald, to Youngstown Steel Door Company, The. Tracking plug door. 3,786,599, Cl. 49-220.000.

Galion, Jeffrey, Inc.: *See—*
Paolini, Alfred P.; and Fife, Warren E., 3,787,091.

Gallagher, Bernard J.: *See—*
Shufflebarger, Earl D.; Gallagher, Bernard J.; Simko, David M.; and Boylan, John R., 3,787,023.

Gallagher, Brendan; and Last, Anthony Graham Marshall, to Imperial Chemical Industries, Limited. Production of extruded foamed synthetic thermoplastic polymer materials. 3,787,542, Cl. 264-51.000.

Gallois, Jacques: *See—*
Kuhn, Karl Walter; and Gallois, Jacques, 3,786,630.

Gamer, Nicholas T.: *See—*
Mizuhara, Howard; and Gamer, Nicholas T., 3,786,854.

Gamertsfelder, George R.; Stavis, Gus; and Vladimir, Leonard O., to Singer Company, The. Doppler antenna calibration apparatus. 3,787,866, Cl. 343-703.000.

Gardner, Willis W., to Waukesha Bearing Corporation. Tilting pad journal bearing. 3,787,105, Cl. 308-73.000.

Gardner-Dever Company: *See—*
Edstrom, Soren E. H., 3,787,154.

Gardocki, Joseph Francis, to McNeil Laboratories, Inc. Method of treating depression with certain diazepinoindoles and anti-depressant compositions thereof. 3,787,577, Cl. 424-274.000.

Garland, Milton W., to Frick Company. Multiple wave form spring valve assembly. 3,786,834, Cl. 137-540.000.

Garlinghouse, Leslie H. Rubber cone concrete bucket. 3,787,084, Cl. 294-71.000.

Garnett, Charles Alexander, to Edward Williams Heldings, Limited. Clamping arrangement. 3,787,132, Cl. 403-290.000.

Garnett, Eubank W., Jr., to Reynolds Metals Company. Apparatus for and method of making a nestable container. 3,786,667, Cl. 72-348.000.

Garon Company: *See—*
Dils, Eugene W., Jr.; Ward, Larry A.; and Ward, Robert A., 3,786,784.

Garrett Corporation, The: *See—*
Lucas, Peter K., 3,787,031.

Garrett, Kenneth M.: *See—*
Miller, Jack E.; and Garrett, Kenneth M., 3,786,592.

Gasner, William Lavier, to McCulloch Corporation. Unitized clutch drum and sprocket. 3,786,687, Cl. 74-243.0cs.

Gates Rubber Company, The: *See—*
Gillman, Leland M.; and Stark, Robert E., 3,787,240.

Gauvreau, Claude, to Holliston Laboratories, Inc. Disinfecting aerosol composition. 3,787,566, Cl. 424-45.000.

Gavlick, John R., Sr. Pipe dryer and odorizer. 3,786,576, Cl. 34-104.000.

Gearheard, Larry P.: *See—*
Clark, James R.; and Gearheard, Larry P., 3,786,579.

Gebr. Giulini GmbH: *See—*
Wittner, Hubert; and Lauer, Kurt, 3,787,311.

Gebr. Isringhausen: *See—*
Sturhan, Klaus, 3,787,025.

Gechele, Walter; and Piazza, Bruno, to Olivetti, Ing., C., & C., S.p.A. Machine for recording visually interpretable data and machine readable information on a ticket. 3,787,875, Cl. 346-74.0mp.

Gedzjun, Vladislav Aloizovich; and Yakovlev, Petr Antipovich. High-voltage capacitor. 3,787,721, Cl. 317-242.000.

General American Transportation Corporation: *See—*
Mowatt-Larssen, Erling, 3,786,955.

General Connectors Corporation: *See—*
Yorke, Roy B.; and Greenwald, Fred A., 3,787,079.

General Electric Company: *See—*
Bennett, James G.; and Katchman, Arthur, 3,787,362.
Binzer, Thomas J.; and Wooding, Peter H., 3,787,674.
Bolin, Larry R.; and Jolly, Shelby A., 3,787,705.
Busian, Vincent V., 3,786,561.
Carmelite, Donald D.; Kramer, Morton; and Lee, Gim F., Jr., 3,787,532.
Grossman, Leonard N.; and Packard, Douglas R., 3,787,761.
Heath, Darrell R.; and Wirth, Joseph G., 3,787,475.
Hobson, Charles F., Jr., 3,787,708.
Holub, Fred P.; and Evans, Milton L., 3,787,439.
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King, William D.; Larson, George D.; Steeoerm, Donald E.; and Winchester, Amos J., Jr., 3,787,667.
Pedersen, Niels P.; and Schultz, Henry L., Jr., 3,787,724.
Pratt, Richard D.; and Ewing, Kenneth W., 3,787,546.
Puckette, Charles M.; Smith, Donald A.; and Butler, Walter J., 3,787,852.
Rice, Milton J., 3,786,648.
Skelly, David W.; and Wagner, Bernard C., 3,787,338.
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Wirth, Joseph G.; and Heath, Darrell R., 3,787,364.
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General Foods Corporation: *See—*
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General Motors Corporation: *See—*
Barr, Paul N.; and Jagodzinski, Tim G., 3,786,789.
Francis, Philip L., 3,787,075.
Harned, John L.; and Johnston, Laird E., 3,787,094.
Harris, James P.; and Katz, Seymour, 3,787,548.
Shellhause, Ronald L., 3,787,029.
Shellhause, Ronald L., 3,787,096.

General Signal Corporation: *See—*
Fruehauf, Waldo G., 3,786,723.

Genma, Susumu, to Victor Company of Japan, Ltd. Phonograph record disc. 3,787,274, Cl. 161-116.000.

Genma, Susumu, to Victor Company of Japan, Ltd. Phonograph record disc. 3,787,275, Cl. 161-116.000.

Genta, Guido R., to American Aniline Products, Inc. Aromatic polyester textile fibers dyed with naphthyloxyanthraquinone dyes. 3,787,177, Cl. 8-39.000.

Gentex Corporation: *See—*
Aileo, Jackson Anthony, 3,786,519.

George, Michel: *See—*
Stevens, Jacques; and George, Michel, 3,787,384.

Gerbrandt, George. Foldable trap. 3,786,593, Cl. 43-100.000.

Geres, Robert J., to United States of America, Navy. Calcium hydride gas generator. 3,787,186, Cl. 23-282.000.

Gervay, Joseph Edmund; and Walker, Peter. Process for modifying surfaces using photopolymerizable elements comprising hydrophilic colloids and polymerizable monomers. 3,787,213, Cl. 96-36.000.

Geurts, Cletus J. Clamp and positioning structure. 3,787,133, Cl. 403-384.000.

Gewerkschaft Eisenhutte Westfalia: *See—*
Hauschopp, Alois; Langem, Werne Lippe; Breuer, Oswald; Ostrop, Berthold; and Steinkuhl, Bernd, 3,787,090.

Ghere, Morris. Automatic player for musical instruments. 3,787,603, Cl. 84-19.000.

Ghirga, Marcello: *See—*

Piccolo, Luigi; Calcagno, Benedetto; and Ghirga, Marcello, 3,787,556.

Giamei, Anthony F.; Hornbecker, Merton F.; and Terkelsen, Bruce E., to United Aircraft Corporation. Directionally solidified article. 3,787,190, Cl. 29-183.000.

Gibert, Guy; and Vidal, Pierre, to Compagnie d'Electronicque et de Piezo-Electricite-C.E.P.E. Flexion mode crystalline bar for an oscillator. 3,787,743, Cl. 310-9.500.

Gibson, Richard R.: *See—*
Pelizzoni, Winton J.; Greathouse, Jack F.; Pekar, Frank J., Jr.; and Gibson, Richard R., 3,786,792.

Giesselmann, Gunter; Schwarze, Werner; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of alkyl isothiocyanic acid esters. 3,787,472, Cl. 260-454.000.

Gilbert, Dixie E., to Phillips Petroleum Company. Rapid heating of parison preforms. 3,787,170, Cl. 432-5.000.

Gillemot, George W.: *See—*
Thompson, John T.; and Gillemot, George W., 3,787,795.

Gillette Company, The: *See—*
Dorion, Francis W., Jr.; Nissen, Warren I.; and Pomfret, Edward E., 3,786,563.

Gillman, Leland M.; and Stark, Robert E., to Gates Rubber Company, The. Composition separator with membrane extension. 3,787,240, Cl. 136-30.000.

Giocomo, James Donald; and Grosso, Harry Anthony, to American Can Company. Pressure relief system for an aerosol container. 3,786,967, Cl. 222-397.000.

Giordmaine, Joseph Anthony; and Kleinman, David Allmond, to Bell Telephone Laboratories, Incorporated. Electrooptic grating for scanning a beam of light. 3,787,111, Cl. 350-160.00r.

Gioria, Jean-Michel: *See—*
Zuntini, Franco; Aliprandini, Giuseppe; Gioria, Jean-Michel; Meyer, Andre; and Losi, Salvatore, 3,787,463.

Gjerde, Erwin G. High velocity gas igniter. 3,787,169, Cl. 431-347.000.

G.K.N. Group Services, Limited: *See—*
Sachs, Kurt; Foreman, Frederick Arthur; and Barlow, John, 3,787,204.

GKN Sankey Ltd.: *See—*
Stanley, Victor William, 3,787,549.

Glass, Marvin, & Associates: *See—*
Breslow, Jeffrey D., 3,787,053.
Glass, Marvin L.; and McKay, Robert S., 3,787,052.

Glass, Marvin L.; and McKay, Robert S., to Glass, Marvin & Associates. Projector and target apparatus including projectile collecting clip which is also a magazine for the projector. 3,787,052, Cl. 273-101.000.

Glatz, Horst, to Deumu Deutsche Erzund Metall-Union Gesellschaft mit beschrankter Haftung. Reinforcing element for concrete structures. 3,786,610, Cl. 52-661.000.

Gleeson, James E.: *See—*
Dereich, John E.; Gleeson, James E.; and Earle, Glenn J., 3,786,714.

Glevum Industrial Designers Limited: *See—*
Shaw, John, 3,786,882.

Globe-Union Inc.: *See—*
Rinnert, Helmut Kurt, 3,786,842.

Gluyas, William W., Jr.: *See—*
Riblett, Edward L., 3,786,575.

Gobel, Axel: *See—*
Ruschig, Heinrich; Schmitt, Karl; Mohler, Werner; Gobel, Axel; and Lindner, Ernst, 3,787,411.

Godard, Regine: *See—*
Dangay, Jean Louis; Dangay, Philippe; and Dangay, Catherine, 3,786,567.

Goffe, William L., to Xerox Corporation. Photoelectrophoretic imaging method including at least one electrode carrying a pattern. 3,787,206, Cl. 96-1.200.

Goggins, William B., Jr.: *See—*
Sletten, Carlyle J.; and Goggins, William B., Jr., 3,787,849.
Sletten, Carlyle J.; and Goggins, William B., Jr., 3,787,850.

Goldberg, Jacob, to United States of America, Navy. Memory and logic module. 3,787,817, Cl. 340-172.500.

Golden, Norman R. Material handling attachment. 3,786,948, Cl. 214-130.00c.

Goldfarb, Adolph E. Reaction game simulating release of treasure. 3,787,050, Cl. 273-1.00r.

Goldner, Heinz-Dieter, to Hartmann & Braun Aktiengesellschaft. Rectifier. 3,787,755, Cl. 321-8.00r.

Goldstein, Irving; Hayward, Gary G.; and Holt, Jon G., to Raytheon Company. Optical lens arrangement. 3,786,757, Cl. 102-70.20p.

Golovoy, Amos: *See—*
Labana, Santokh S.; and Golovoy, Amos, 3,787,521.

Good, Alan E.; and Ward, Delbert R., to Brown & Root, Inc. Method and apparatus for entrenching submerged elongate structures. 3,786,642, Cl. 61-72.400.

Goodrich, B. F., Company, The: *See—*
De Witt, Elmer J., 3,787,187.
Hotchkiss, Marvin E., 3,786,904.
Korolyshun, Russell T.; and Rehnborg, P. Mark, 3,786,676.
Mikofalvy, Bela K.; and Knechiges, Donald P., 3,787,232.

Goodrich, Robert S.: *See—*
Kalfsbeek, James S.; Kalfsbeek, Peter C.; and Goodrich, Robert S., 3,787,646.

Goodwin, Edwin C., Jr.; Larkin, Oscar L.; and Erni, Heinrich H., to Allis-Chalmers Corporation. Vacuum switch cam operating mechanism with contact loading compression spring. 3,787,649, Cl. 200-153.0la.

Goodwin, William D., to Athlon Corporation, The. Whole protein shampoo composition. 3,787,337, Cl. 252-545.000.

Goodyear Aerospace Corporation: *See—*
Dotson, Charles R., 3,787,840.

Goodyear Tire & Rubber Company, The: *See—*
Appleby, Paul E.; Brinkley, Max D.; and Griffiths, Robert I., 3,787,262.

Gorbunov, Boris Nikolaevich; Lukashov, Anatoly Ivanovich; Mukhortova, Tamara Ivanovna; and Khardin, Alexandr Pavlovich. Isoprene polymerization inhibitor. 3,787,515, Cl. 260-681.500.

Gordon, Claude E. Alarm system. 3,787,831, Cl. 340-274.000.

Gordon, Paul C.: *See—*
Scarnato, Thomas J.; Gordon, Paul C.; Sorensen, Robert; and Lawler, Craig M., 3,786,620.

Gorina, Vera Mikhailovna: *See—*
Vorobeva, Antonina Ivanovna; Gorina, Vera Mikhailovna; and Obolentsev, Roman Dmitrievich, 3,787,502.

Gosteli, Jacques, to Ciba-Geigy Corporation. Dibenzo[b,f]thiepin-10-carboxylic acids. 3,787,444, Cl. 260-327.00b.

Gottfried Reuter GmbH: *See—*
Cutler, Richard, 3,787,127.

Gourlay, Robert D., to Hughes Aircraft Company. Fluid actuated electric generator. 3,787,741, Cl. 310-8.800.

Gourse, Jerome A., to Velsicol Chemical Corporation. Fire retardant compositions. 3,787,356, Cl. 260-45.75b.

Grace, W. R., & Co.: *See—*
Acker, Ellsworth G.; and Winyall, Milton E., 3,787,561.
Guthrie, James L.; and Rendulic, Francis J., 3,787,303.

Grace, W. R., & Company: *See—*
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Graco Inc.: *See—*
Hagfors, Gerald D., 3,786,990.

Grad-Line Inc.: *See—*
Long, George E.; Reesf, Dennis L.; and Johnson, Floyd C., 3,786,871.

Graefnitz, Russell F.; and Lohrman, Glenn G., to Duncan Electric Company, Inc. Meter magnet with strip-wound current coil. 3,787,766, Cl. 324-137.000.

Graham, D. Douglas: *See—*
Bowls, Victor C.; and Graham, D. Douglas, 3,786,793.

Grand Haven Stamped Products Company: *See—*
Druhn, Max R. C., Jr., 3,786,690.

Granges Essem AB: *See—*
Eliasson, Karl Bertil, 3,786,623.

Grant, Gerald E.: *See—*
Brown, Wayne; Fabere, Raymond W.; Grant, Gerald E.; and Sons, Charles C., 3,786,848.

Grant, Herbert L., to Hops Extract Corporation of America. Extraction of pure bitter acids from hops or crude hop extract. 3,787,499, Cl. 260-586.00r.

Grant, Norman H.: *See—*
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Grapha Maschinenfabrik Hans Muller AG: *See—*
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Grassmayr, Klaus: *See—*
Bretschneider, Hermann; Grassmayr, Klaus; Hohenlohe-Oehringen, Kraft; and Grussner, Andre, 3,787,491.

Gratton, Peter D.: *See—*
Donahue, William J.; Gratton, Peter D.; and Cammack, Thomas A., 3,786,754.

Gravos, Leif H. Animal feeder. 3,786,786, Cl. 119-52.00a.

Gray, Charles A.: *See—*
Seglin, Leonard; and Gray, Charles A., 3,787,193.

Greathouse, Jack F.: *See—*
Pelizzoni, Winton J.; Greathouse, Jack F.; Pekar, Frank J., Jr.; and Gibson, Richard R., 3,786,792.

Greatline, Stanley E.; and Grismore, Fred Leland, to Southern Illinois University Foundation. Airborne navigation apparatus. 3,787,860, Cl. 343-106.00r.

Greaves, Melvin J.; and Werner, Tage, to McKee, Arthur G., & Company. Supporting apparatus for vessels. 3,786,606, Cl. 52-223.000.

Greb, Daniel W.: *See—*
Greb, Kenneth W.; and Greb, Daniel W., 3,786,959.

Greb, Kenneth W.; and Greb, Daniel W. Paper clip dispenser. 3,786,959, Cl. 221-261.000.

Greenfield, George L., to Milchem Incorporated. Acrylic compositions. 3,787,488, Cl. 260-537.00s.

Greenleaf Holdings, Limited: *See—*
Mackin, Wilson Joseph, 3,786,712.

Greenshields, James Nairn; Jones, Ida May; Moilliet, John Lewis; and Poole, Victor David, to Imperial Chemical Industries, Limited. Colouration process. 3,787,173, Cl. 8-1.00e.

Greenville Steel Car Company: *See—*
Beers, Albert Alvin, Jr.; Stoyer, Paul Eugene; and Lightner, Joseph Campbell, Jr., 3,786,764.

Greenwald, Fred A.: *See—*
Yorke, Roy B.; and Greenwald, Fred A., 3,787,079.

Gregg, Jack C.; and Davis, Samuel L. Piston puller. 3,786,551, Cl. 29-266.000.

Gregg, Paul S., to Ransburg Electro-Coating Corp. Spark detector apparatus and method. 3,787,707, Cl. 317-9.00r.

Gregory, Alvin L. Power plant. 3,787,140, Cl. 415-80.000.

Grenier, Raymond P., to Baird-Atomic, Inc. Zone grid assembly particularly for high resolution radioactivity distribution detection systems. 3,787,685, Cl. 250-71.50s.

Grewe, Ferdinand: *See—*
Scholl, Hans-Joachim; Klauke, Erich; Grewe, Ferdinand; and Hammann, Ingeborg, 3,787,435.

Griehl, Wolfgang; Hahn, Wolfdiether; and Stoll, Bernhard, to Inventa A.G. fur Forschung und Patentverwertung. Process for the continuous transesterification of dicarboxylic acid esters with diols. 3,787,479, Cl. 260-475.00p.

Griffiths, Robert I.: *See—*
Appleby, Paul E.; Brinkley, Max D.; and Griffiths, Robert I., 3,787,262.

Grimm, Ronald F. Trailer for bicycles. 3,787,065, Cl. 280-204.000.

Grindstaff, Lloyd I.; and Whittaker, Mack P. Graphitization of mesophase pitch fibers. 3,787,541, Cl. 264-29.000.

Grismore, Fred Leland: *See—*
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Grohoski, Edward G.: *See—*
Morton, Robert D.; and Grohoski, Edward G., 3,786,527.

Gronpement Atomique Alsacienne Atlantique: *See—*
Carbonnel, Henry; and Borie, Robert, 3,787,143.

Grossman, Leonard N.; and Packard, Douglas R., to General Electric Company. Method of detecting magnetic additives in nuclear fuel material by noting change in weight of material when weighed in a magnetic field. 3,787,761, Cl. 324-34.00r.

Grosso, Harry Anthony: *See—*
Giocomo, James Donald; and Grosso, Harry Anthony, 3,786,967.

Grow Chemical Corporation: *See—*
Hoffman, Edward P.; and Sikorski, Robert P., 3,787,230.

Grubbs, Conway E.: *See—*
Anderson, Dale R.; and Grubbs, Conway E., 3,787,655.

Gruetter, Walter: *See—*
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Grunberg, Emanuel; and Hoffer, Max, to Hoffmann-La Roche Inc. 2,4-Diamino-5-(3-alkoxy-4,5-methylenedioxybenzyl) pyrimidine. 3,787,409, Cl. 260-256.40n.

Grunberg, Georges; Melnick, Igor; and Lazzari, Jean Pierre, to Commissariat a l'Energie Atomique. Method of making a thin film having a high coercive field. 3,787,237, Cl. 117-239.000.

Grundig E.M.V. Elektro-Mechanische: *See—*
Mangold, Hans; and Klein, Walter, 3,787,784.

Grussner, Andre: *See—*
Bretschneider, Hermann; Grassmayr, Klaus; Hohenlohe-Oehringen, Kraft; and Grussner, Andre, 3,787,491.

GTE Automatic Electric Laboratories Incorporated: *See—*
Busch, John E., 3,787,633.
Dewitte, Maurice J.; and Wojciechowski, Gerald L., 3,787,735.
Herr, Kurt F., 3,787,731.
Young, Robert F., Jr., 3,787,642.

GTE Information Systems, Incorporated: *See—*
Rogers, William P., 3,787,833.
Sherman, Frederick A., 3,787,820.

GTE Sylvania Incorporated: *See—*
Le Fevre, Paul Eshelman, 3,787,788.
Murphy, William D.; Williams, George Norman; Wilson, Robert F.; and Zmuda, Edward I., 3,787,610.
Murphy, William D.; and Zmuda, Edward I., 3,787,750.

Guaglione, Giovanni Paolo, to I-T-E Imperial Corporation. Conductor support for transition from gas bus enclosure tube to power circuit breaker. 3,787,604, Cl. 174-18.000.

Guerrero, Michael Carl, to American Hospital Supply Corporation. Centrifuge rotor assembly. 3,786,986, Cl. 233-26.000.

Guillaume, Jacques: *See—*
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Gulf & Western Metals Forming Company: *See—*
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Gulf & Western Metals Forming Company, mesne: *See—*
Esghbaugh, John T.; and Lindahl, Gerbert S., 3,786,651.

Gulf Oil Canada Limited: *See—*
Taylor, Charles T., 3,786,826.

Gulf Research & Development Company: *See—*
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Gulick, Ronald A.: *See—*
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Gunther, Peter: *See—*
Oberkirch, Wolfgang; Gunther, Peter; and Pampus, Gottfried, 3,787,381.

Guthrie, James L.; and Rendulic, Francis J., to Grace, W. R., & Co. Radiation curable polyene-polythiol coating compositions. 3,787,303, Cl. 204-159.150.

Haag, Werner O.; and Miale, Joseph N., to Mobil Oil Corporation. Oxidative dehydrogenation of paraffins. 3,787,517, Cl. 260-683.300.

Habegger, James D.: *See—*
Daigle, Jack R.; and Habegger, James D., 3,786,944.

Habegger, James D.; Huttula, Andrew B.; Fowler, Daniel L.; and Schrader, James T., to Rapistan, Incorporated. Method and apparatus for sorting articles on a conveyor utilizing a shift register and a time varying code control mechanism. 3,786,939, Cl. 214-1.00a.

Haberle, Heinz; and Herter, Eberhard, to International Standard Electric Corporation. System for controlling the transmit time of stations which are in communication with one another via a satellite. 3,787,634, Cl. 179-15.0bs.

Habermann, Helmut; Loyen, Roger; deceased (by Loyen, Ghislaine, nee Voisin; administratrix); Joly, Pierre; Auber, Yvan; and Malmaison, Rueil, to Etat Francais represente par le Ministre d'Etat charge de la Defense Nationale Delegation Ministerielle pour l'rmement Direction Technique des Engins Laboratoire de Recherches Balistiques et Aerodynamiques. Devices including rotating members supported by magnetic bearings. 3,787,100, Cl. 308-10.000.

Hack, Helmuth: *See—*
Schrader, Gerhard; Eue, Ludwig; Hack, Helmuth; Hirane, Seiichi; Aya, Masahiro; Kishino, Shigeo; and Fukazawa, Nobuo, 3,787,538.

Hafele, James F.: *See—*
Riblett, Edward L., 3,786,575.

Haga, Shoji; and Komorizono, Kunichi, to Toyota Jidosha Kogko Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha. Clutch release cylinder for vehicles. 3,786,903, Cl. 192-91.00r.

Hagelbarger, David William, to Bell Telephone Laboratories, Incorporated. Multitone telephone dialing circuit employing digital-to-analog tone synthesis. 3,787,836, Cl. 340-347.0da.

Hagfors, Gerald D., to Graco Inc. Plural component gun. 3,786,990, Cl. 239-112.000.

Hagimoto, Hiroshi; Arai, Torhiharu; Yoshikawa, Harutoshi; Watanabe, Mitsuo; and Okada, Yoshiyuki, to Takeda Chemical Industries, Ltd. Herbicidal compositions containing various benzylthiodiazoles and triazines. 3,787,198, Cl. 71-93.000.

Hagino, Hiroshi: *See—*
Nakayama, Kiyoshi; Hagino, Hiroshi; and Yoshida, Hajime, 3,787,287.

Hagiwara, Yoshihide, to Japan Natural Food Co., Ltd. Process for producing powders of green leaves of wheat and barley. 3,787,591, Cl. 426-373.000.

Hagmann, Mark J.: *See—*
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Hagopian, Nubar D.; and Colman, John M., to Medical Innovations, Inc. Leg unit inserts. 3,786,802, Cl. 128-24.00r.

Hahn, Wolfdiether: *See—*
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Haid, Eric: *See—*
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Halasa, Adel F.; and Oberster, Arthur E., to Firestone Tire & Rubber Company. Continuous process of copolymerizing butadiene and styrene. 3,787,377, Cl. 260-83.700.

Halbrook, Noah J.: *See—*
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Hamano, Sachiyuki; Nakamura, Takaharu; Kuriyama, Shizuo; and Yamanaka, Motosuke, to Eisai Company, Ltd. 3-Sulfamyl-4-chlorobenzoic acid derivatives. 3,787,440, Cl. 260-326.100.

Hammann, Ingeborg: *See—*
Colln, Reimer; Hammann, Ingeborg; Unterstenhafer, Gunter; and Behrenz, Wolfgang, 3,787,539.
Scholl, Hans-Joachim; Klauke, Erich; Grewe, Ferdinand; and Hammann, Ingeborg, 3,787,435.
Stolzer, Claus; Hammann, Ingeborg; Unterstenhofer, Gunter; and Homeyer, Bernhard, 3,787,535.

Hammer, Leslie G.; and Reynolds, Charles A., Jr., to Pioneer Medical Systems, Inc. Defibrillator output energy measuring circuit. 3,787,767, Cl. 324-142.000.

Hammond, John S.: *See—*
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Hampel, Bruno: *See—*
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Hanselmann, Daniel; and Wildbolz, Rudolf, to Maschinenfabrik Rieter AG. Apparatus for separating fiber flocks from a transporting air stream. 3,787,093, Cl. 302-61.000.

Hanson Scale Company: *See—*
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Hara, Hauruichi: *See—*
Ichihara, Shoichi; Hara, Hauruichi; and Ohara, Tskashi, 3,787,333.

Hare, George F.: *See—*
Ciccone, Thomas Q.; Hare, George F.; and Nimylowycz, Osyp, 3,786,761.

Harigaya, Shoichi: *See—*

Himizu, Junichi; Harigaya, Shoichi; Ishida, Akihiko; Yoshikawa, Kaoru; and Sato, Masanori, 3,787,448.

Harmon, Jerome Z. Simulated pocket ornament and holder. 3,786,520, Cl. 2-279.000.

Harned, John L.; and Johnston, Laird E., to General Motors Corporation. Hydraulic anti-lock brake control system. 3,787,094, Cl. 303-10.000.

Harris, Glyn Islwyn; and Edwards, Alfred Gerald, to Albright & Wilson, Limited. Phenol-aralkyl ether resins. 3,787,350, Cl. 260-38.000.

Harris, Guy H., to Dow Chemical, The. Dithio- and thiono-garbamate mineral value collectors. 3,787,471, Cl. 260-455.00a.

Harris, James P.; and Katz, Seymour, to General Motors Corporation. Method of applying pressure sensitive adhesive to an article. 3,787,548, Cl. 264-259.000.

Harris, John L., to Deltrol Corporation. Switching mechanism. 3,787,789, Cl. 335-193.000.

Harrison, Ian T.: *See—*
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Hartford Special Machinery Company, The: *See—*
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Hartmann & Braun Aktiengesellschaft: *See—*
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Harvey Hubbell, Incorporated: *See—*
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Hasebe, Takefumi; and Ando, Toshiaki, to Yokogawa Electric Works, Ltd. Self-balancing instrument. 3,787,828, Cl. 340-187.000.

Hasegawa, Masanaru; Hayashi, Yoshiki; and Matsumura, Toichi, to Matsushita Electric Industrial Company Ltd. Electrophotographic photosensitive plate having a polyimide intermediate layer. 3,787,207, Cl. 96-1.500.

Hashimoto, Kunio: *See—*
Shimada, Sadakuni; Hashimoto, Kunio; Kondoh, Ken; and Koyama, Masaki, 3,787,787.

Hashimto, Naoki: *See—*
Watanabe, Masaru; Yamauchi, Nobuharu; Hashimto, Naoki; and Tamama, Teteuo, 3,787,863.

Haskal, Haim, to Honeywell Inc. Recording apparatus with beam intensity control means. 3,787,888, Cl. 346-108.000.

Haskell, Robert E. Method of making prestressed/beams. 3,786,548, Cl. 29-155.00r.

Hastings, Charles E.; Rounion, William A.; Comstock, Allen L.; and Bradbury, Joseph T., to Teledyne, Inc. Radio navigation system. 3,787,844, Cl. 343-6.00r.

Hastings, Thomas C. Humidifier. 3,787,036, Cl. 261-29.000.

Hathcock, James S., Jr., to Coneo Inc. Warehousing system using slow-down and stop bin indicators. 3,786,929, Cl. 214-16.40a.

Hatsell, William Alden, to RCA Corporation. Printing apparatus. 3,787,722, Cl. 317-262.00a.

Hauck, Erwin A.; Lyle, Don M.; and Wollum, James E., to Burroughs Corporation. Multiprocessing system having means for automatic resource management. 3,787,816, Cl. 340-172.500.

Haufe, Juergen: *See—*
Beck, Fritz; Haufe, Juergen; and Nohe, Heinz, 3,787,299.

Hauschopp, Alois; Langem, Werne Lippe; Breuer, Oswald; Ostrop, Berthold; and Steinkuhl, Bernd, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installations. 3,787,090, Cl. 299-43.000.

Hautier, Claude. Gyroscopic device for the stabilization of laterally unstable vehicles. 3,787,066, Cl. 280-217.000.

Hay, Donald A.: *See—*
Finlay, Walter L.; Nayar, Harbhajan S.; and Hay, Donald A., 3,787,200.

Hay, William D., to Unit Process Assemblies, Inc. Supporting device. 3,786,686, Cl. 74-33.000.

Hayashi, Yoshihiro; and Iwatsuki, Masahiro, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Emergency locking device for safety seat belt used in motor vehicles and the like. 3,787,002, Cl. 242-107.400.

Hayashi, Yoshiki: *See—*
Hasegawa, Masanaru; Hayashi, Yoshiki; and Matsumura, Toichi, 3,787,207.

Hayashida, Hidenori; and Nakahara, Ryoji. Non-poisonous zinc plating baths. 3,787,296, Cl. 204-55.00r.

Haydon, Arthur W., to Tri-Tech, Inc., mesne. Counting device. 3,787,663, Cl. 235-92.00c.

Haynes, Lincoln W. Fraction mat for automobiles. 3,786,989, Cl. 238-14.000.

Hayward, Gary G.: *See—*
Goldstein, Irving; Hayward, Gary G.; and Holt, Jon G., 3,786,757.

Heath Company: *See—*
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Heath, Darrell R.: *See—*
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Heath, Darrell R; and Wirth, Joseph G., to General Electric Company. Process for making aryloxy derivatives of aromatic diesters and dinitriles. 3,787,475, Cl. 260-465.00f.

Hebel, Ulrich: *See—*
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Hedenas, Bo Gustav Valter: *See—*
Melkersson, Karl-Axel; and Hedenas, Bo Gustav Valter, 3,786,619.

Heger, Adolf: *See—*
Passler, Helmar; Heger, Adolf; and Fronius, Sabine, 3,787,260.

Heger, Adolf; Passler, Helmar; and Patitz, Ellen, to VEB Textilkombinat Cottbus. Process for texturizing fibers obtained by splitting synthetic foils and products made therefrom. 3,787,261, Cl. 156-84.000.

Heimsch, Robert A.; Bartosczewicz, John S.; and Slocombe, Robert J., to Monsanto Company. Polymeric photosensitive compositions and methods using same. 3,787,212, Cl. 96-35.100.

Heinert, Dietrich H.: *See—*
Woo, James T. K.; and Heinert, Dietrich H., 3,787,483.

Heinrichs, Alfred J.: *See—*
Kleinfeld, Martin J.; and Heinrichs, Alfred J., 3,787,259.

Heller, Anton H., to Poweray Infrared Corporation. Asphalt storage and loading apparatus and method. 3,786,800, Cl. 126-343.50a.

Heller, George L.; Eckert, Frank J.; De Land, Charles L.; and Dingman, Robert W., to Cities Service Company. Carbon blacks having improved dispersion and platewear characteristics. 3,787,562, Cl. 423-445.000.

Hellmann, Richard L. Aircraft traffic control board game apparatus. 3,787,056, Cl. 273-134.000.

Hellmuth, Walter W.; and Miller, Edward F., to Texaco Inc. Method for recovering ashless lubricating oil dispersant. 3,787,497, Cl. 260-583.00n.

Helme Products, Inc.: *See—*
Scheppe, John J.; and Carini, Raymond N., 3,786,573.

Hemmings, Keith Reginald; and Fowler, Gerald, to British Leyland Truck & Bus Division Ltd. Motor vehicle joint. 3,787,130, Cl. 403-205.000.

Hendricks, Udo, to Bayer Aktiengesellschaft. Melamine-derivatives. 3,787,407, Cl. 260-249.600.

Hennessey, Russell J., to Hoerner Waldorf Corporation. Carton opener. 3,786,983, Cl. 229-51.0wb.

Henry, Nelson R., to Woodman Company, Inc., The. Web roll cradle with positive drive. 3,787,001, Cl. 242-75.430.

Heppenstall Company: *See—*
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Hepworth and Grandage Limited: *See—*
Sutherland, Alan, 3,786,857.

Heraeus, W. C., GmbH: *See—*
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Herbert, Werner: *See—*
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Herbst, Klaus: *See—*
Weegen, Lorenz; Luders, Albrecht; Brinkmann, Heinz; Herbst, Klaus; and Ernst, Gerd, 3,787,092.

Herr, Kurt F., to GTE Automatic Electric Laboratories, Incorporated. Electrically interlocking pushbutton circuit with error indication. 3,787,731, Cl. 307-115.000.

Herter, Eberhard: *See—*
Haberle, Heinz; and Herter, Eberhard, 3,787,634.

Hertrich, Klaus, to VEB Polygraph Leipzig, Kombinat fur Polygraphische Maschinen und Austustungen. Device for adjusting the spring force on folding rollers. 3,786,742, Cl. 100-99.000.

Hertrich, Klaus, to Veb Polygraph Leipzig Kombinat fur polygraphische Maschinen und Austrustungen. Rotary folding apparatus. 3,787,041, Cl. 270-64.000.

Hertrich, Klaus, to Veb Polygraph Leipzig, Kombinat fur Polygraphische Maschinen und Austrustungen. Folding apparatus for webfed rotary printing presses. 3,787,042, Cl. 270-70.000.

Herwig, Walter: *See—*
Bohn, Lothar; Cherdron, Harald; Fleissner, Manfred; and Herwig, Walter, 3,787,530.
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Heuser, Paul F.: *See—*
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Hewlett-Packard Company: *See—*
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Hewlett-Packard GmbH: *See—*
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Hewlett-Packard Ltd.: *See—*
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Heye, Hermann: *See—*
Becker, Kurt; and Seidel, Hans-Georg, 3,786,707.
Becker, Kurt; and Seidel, Hans-Georg, 3,787,196.

Heymanns, Willia, to Jagenberg-Werk AG. Apparatus for broad-drawing sheet materials. 3,786,975, Cl. 226-194.000.

Hidaka, Mikio: *See—*
Yamada, Keisho; Umemura, Sumio; Ohdan, Kyoji; Hidaka, Mikio; Bando, Yasuo; Fukuda, Kazuo; and Sawazi, Masao, 3,787,334.

Higuchi, Takeru, to Alza Corporation. Trichlorsethanol and trifluroethanol topical and percutaneous steroid absorption promoters. 3,787,571, Cl. 424-239.000.

Hilgedick, James R., 1/2 to Bowen, Lloyd. Remote control system using frequency coding over telephone link. 3,787,811, Cl. 340-163.00r.

Hilgenbrink, John T., to Continental Can Company, Inc. Double stage necking. 3,786,957, Cl. 220-83.000.

Hiltmann, Rudolf: *See—*
Wollweber, Hartmund; Hiltmann, Rudolf; and Stendel, Wilhelm, 3,787,575.

Himizu, Junichi; Harigaya, Shoichi; Ishida, Akihiko; Yoshikawa, Kaoru; and Sato, Masanori, to Tanabe Seiyaku Co. Ltd. 10-Oxaprostanoic acid derivatives. 3,787,448, Cl. 260-343.600.

Hines, Robin H.: *See*—
Nowicki, Thomas; Shipp, John I.; Hines, Robin H.; and Broadbent, Thomas D., 3,787,118.
Hinz, Hans Dieter, to U.S. Philips Corporation. Durable registration template for electrostatic printers. 3,786,745, Cl. 101-1.000.
Hirane, Seiichi: *See*—
Schrader, Gerhard; Eue, Ludwig; Hack, Helmuth; Hirane, Seiichi; Aya, Masahiro; Kishino, Shigeo; and Fukazawa, Nobuo, 3,787,538.
Hirco, Bernard, to Commissariat a l'Energie Atomique. Apparatus for atomic absorption spectrophotometry. 3,787,120, Cl. 356-85.000.
Hirotsu, Yoshiyuki: *See*—
Aishima, Itsuho; Sakurai, Hisaya; Takashi, Yukichi; Morita, Hideo; Hirotsu, Yoshiyuki; and Hamada, Tetsuo, 3,787,323.
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Hitachi, Ltd.: *See*—
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Hobart Manufacturing Company, The: *See*—
Allen, Kenneth C.; and Boshinski, Edwin E., 3,786,881.
Hobson, Charles F., Jr., to General Electric Company. Monitor system for ground fault relay. 3,787,708, Cl. 317-18.00d.
Hodgdon, Russell B., Jr.; and Roach, Edward T., to Ionics, Incorporated. Process for defouling anion exchange resins with chlorine dioxide. 3,787,339, Cl. 260-2.10r.
Hodges, Kenneth James Hamer: *See*—
Arnold, John Spencer; Beck, George Morland; Boom, Roger John; Cosserat, David Cockburn; Hodges, Kenneth James Hamer; Sandeman, Theodor Duncan; Williams, Roger Morley; and O'Halloran, Michael, 3,787,818.
Hoehn, Arthur F., Trustee: *See*—
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Hoehn, Hans; and Denzel, Theodor, to Squibb, E. R., & Sons, Inc. Derivatives of dipyrazolo (3,4-b; 3',4'-2) pyridines. 3,787,430, Cl. 260-296.00h.
Hoerner Waldorf Corporation: *See*—
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Hoffer, Max: *See*—
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Hoffman, Edward P.; and Sikorski, Robert P., to Grow Chemical Corporation. Method of applying powder paint. 3,787,230, Cl. 117-102.00a.
Hoffmann-La Roche Inc.: *See*—
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Fahrenholtz, Kenneth Earl, 3,787,453.
Grunberg, Emanuel; and Hoffer, Max, 3,787,409.
Hofford, Thomas P.; and De Vines, Hollis L., to Schlage Lock Company. Display mount for locks. 3,786,578, Cl. 35-49.000.
Hohenlohe-Oehringen, Kraft: *See*—
Bretschneider, Hermann; Grassmayr, Klaus; Hohenlohe-Oehringen, Kraft; and Grussner, Andre, 3,787,491.
Hohl Machine & Conveyor Co., Inc.: *See*—
Milazzo, Carl J., 3,786,911.
Hokanson, Allan E.; Katzen, Raphael; and Schwartz, Bernard W. Densified hop products and process for producing same. 3,787,586, Cl. 426-221.000.
Holbrook, Le Grand K., to Medical Development Corporation. Syringe construction. 3,786,811, Cl. 128-218.00p.
Holliston Laboratories, Inc.: *See*—
Gauvreau, Claude, 3,787,566.
Holson Company, The: *See*—
Holson, Sheldon, 3,786,584.
Holson, Sheldon, to Holson Company, The. Photo display frame and attachment means therefor. 3,786,584, Cl. 40-124.000.
Holt, Jon G.: *See*—
Goldstein, Irving; Hayward, Gary G.; and Holt, Jon G., 3,786,757.
Holub, Fred P.; and Evans, Milton L., to General Electric Company. Imido-substituted organopoly-siloxane compositions. 3,787,439, Cl. 260-326.00e.
Holz, Emil, to Finckh, Hermann, Metalltuch-und Maschinenfabrik. Pressure filter for fibrous suspensions. 3,786,918, Cl. 209-273.000.
Homeyer, Bernhard: *See*—
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Honeywell Inc.: *See*—
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Lazar, Jeffrey M., 3,787,026.
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Honeywell Information Systems, Inc.: *See*—
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Nelson, Paul E.; and Peterson, Russell H., 3,787,670.
Honeywell Information Systems Italia S.p.A.: *See*—
Filippazzi, Franco; and Forlani, Franco, 3,787,252.
Honjo, Satoru; and Tamai, Yasuo, to Xerox Corporation. Method of electrophotographic sensitive paper. 3,787,235, Cl. 117-218.000.
Hooker Chemical Corporation: *See*—
Zimberg, Walter M.; Schulz, Arthur C.; and Woehr, George C., 3,787,369.
Hoover, Troy Eugene, to National Cash Register Company, The. Alkylamino spiro [12-H[1] benfopyhan [3,2f]-quinoline-12,1'phthalide. 3,787,325, Cl. 260-287.00r.
Hoover, Troy Eugene, to National Cash Register Company, The. Substituted dialkylamino-phthol (yl/an) acridan compounds. 3,787,412, Cl. 260-279.00r.
Hope, Henry, X-Ray Products, Inc.: *See*—
Fidelman, David, 3,787,689.
Hope Kabushiki Kaisha: *See*—
Mochizuki, Tetsuya, 3,786,581.
Hops Extract Corporation of America: *See*—
Grant, Herbert L., 3,787,499.
Horn, Peter; Schuster, Ludwig; Falkenstein, Georg; and Joschek, Hans-Ingo, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Continuous manufacture of high molecular weight linear polycarbonates. 3,787,359, Cl. 260-47.000.
Hornbecker, Merton F.: *See*—
Giamei, Anthony F.; Hornbecker, Merton F.; and Terkelsen, Bruce E., 3,787,190.
Horney, David C.: *See*—
DePriester, Donald Jack; Horney, David C.; and Mangels, Robert H., 3,787,064.
Horst, Thomas A., to Western Sales and Supply Co. Binocular holder. 3,787,021, Cl. 248-316.00b.
Horstmann, Harald: *See*—
Linke, Siegfried; Sitt, Rudiger; Horstmann, Harald; and Meng, Karl, 3,787,431.
Horton, George F. Safety cut-off device for ignition switch. 3,786,892, Cl. 180-99.000.
Horwath, Iibor G., to United States of America, Army. Pulse producing circuit. 3,787,738, Cl. 307-237.000.
Hotchkiss, Marvin E., to Goodrich, B. F., Company, The. Segmented friction member assembly. 3,786,904, Cl. 192-107.00r.
Houe, Richard D., to Rockwell International Corporation. Single lever joy-stick apparatus. 3,786,689, Cl. 74-471.0xy.
Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz-Wander, Inc. 5-(Alpha-amino benzyl)-10,11-dihydro- and -5H-dibenzo[a,d]cyclohepten-5-ols and the salts thereof. 3,787,495, Cl. 260-570.50r.
Housholder, Ross F. Optics index filing system. 3,786,931, Cl. 211-40.000.
Houston Chronical Publishing Company: *See*—
Underwood, Jereld L., 3,787,264.
Houston, Robert W., to Applied Power Industries, Inc. Tire changer apparatus. 3,786,851, Cl. 157-1.100.
Houston, Robert W., to Applied Power Industries, Inc. Tire changer apparatus. 3,786,852, Cl. 157-1.100.
Howard, Shirly L., to International Telephone and Telegraph Corporation. Scanning cylindrical antenna for a phase comparison guidance system. 3,787,859, Cl. 343-106.00r.
Howe Felding Furniture, Incorporated: *See*—
Burr, Alan Carleton, 3,787,134.
Howe Folding Furniture, Incorporated: *See*—
Burr, Alan Carleton, 3,786,765.
Hruby, Frank J. Livestock feed process. 3,787,583, Cl. 426-53.000.
Hsu, Grace F.: *See*—
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Huber, Joseph B.: *See*—
Brown, Thomas A.; and Huber, Joseph B., 3,786,546.
Huettner, Lothar A. Direct fired water heater. 3,786,798, Cl. 126-350.00r.
Huffer, Wilson R.: *See*—
Dodge, Robert J.; and Huffer, Wilson R., 3,787,867.
Huffman, Lowell E., to Delro Inc., mesne. Water purification system. 3,786,924, Cl. 210-257.000.
Huggins, Homer D., to Modine Manufacturing Company. Heating and air conditioning system. 3,786,860, Cl. 165-50.000.
Hughes Aircraft Company: *See*—
Charlton, Donald A.; and Ajioka, James S., 3,787,869.
Gourlay, Robert D., 3,787,741.
Kiewit, David A., 3,787,720.
Laundry, Terrence H.; Luther, Richard L.; and Murray, John S., Jr., 3,787,848.
Hughes, Benjamin F. Conducting fluid type gravity safety switch with spiral contacts. 3,787,647, Cl. 200-61.470.
Hughes, Gordon Alan; and Smith, Herchel, said Hughes assor. to said Smith, Herchel. 13-Ethyl-11-oxygenated gonenes. 3,787,395, Cl. 260-239.55c.
Hughes, Robert B., to Westinghouse Electric Corporation. Low PRF pulse doppler radar having low speed ground moving target rejection. 3,787,851, Cl. 343-7.700.
Hujer, Friedrich; and Knapp, Walter, to Agfa-Gevaert Aktiengesellschaft. Apparatus for detecting and evaluating indicia on processed photographic film or the like. 3,787,702, Cl. 250-219.00d.
Hull, Charles W.; and McKinney, Charles R., to Bell & Howell Company. Magnetic mass spectrometer with shaped, uniformly saturating magnetic poles. 3,787,790, Cl. 335-210.000.
Hunter Engineering Company, Inc.: *See*—
Cromp, Theodore O., 3,787,171.
Hurt, William S.: *See*—
Bayer, Horst O.; Hurt, William S.; and Aller, Harold E., 3,787,536.
Hurt, Zeno, to AGON Uhrenfabrik Robert Triebold AG. Digital watch. 3,786,626, Cl. 58-88.00r.
Hutchinson, Peter; and Darnbrough, Geoffrey, to I.W.S. Nominee, Company Limited. Textile crimping. 3,786,538, Cl. 28-1.600.
Huttula, Andrew B.: *See*—

Habegger, James D.; Huttula, Andrew B.; Fowler, Daniel L.; and Schrader, James T., 3,786,939.
Hyatt, Frederick; and Coburn, Theodore Robert, to Marhsall & Williams Company. Precision slitting machine for plastic sheeting. 3,786,706, Cl. 83-122.000.
Hydrophilics International, Inc.: *See*—
Blank, Izhak, 3,787,378.
Hyldon, Roy G., to Quaker Oats Company, The. Instant grits. 3,787,584, Cl. 426-208.000.
Hypertherm, Incorporated: *See*—
Couch, Richard W., Jr., 3,787,247.
I-T-E Imperial Corporation: *See*—
Guaglione, Giovanni Paolo, 3,787,604.
Iadarola, Ralph E.: *See*—
Lademann, Ernest E.; and Iadarola, Ralph E., 3,786,685.
Ichihara, Shoichi; Hara, Hauruichi; and Ohara, Tskashi, to Nippon Shokubai Kogyo Co., Ltd. Method for the production of an automotive exhaust gas catalyst. 3,787,333, Cl. 252-465.000.
Ichikawa, Mitsuo: *See*—
Nishioka, Akinori; Kawatani, Shigeo; and Ichikawa, Mitsuo, 3,787,358.
Ichikawa, Yataro; Tokashiki, Michiyuki; and Kobayashi, Osamu, to Teijin Limited. Method of separating unreacted terephthalic acid. 3,787,480, Cl. 260-475.0pr.
Ichioka, Satoshi; and Takeuchi, Shinjiru, to Mishima Kosan Company, Ltd. Magnetic ink recording system. 3,787,879, Cl. 346-140.000.
ICI America Inc.: *See*—
Burns, Joseph P.; Feltzin, Joseph; and Kuehn, Erich, 3,787,526.
Iglehart, Hilary H.: *See*—
Iglehart, Jesse H.; and Iglehart, Hilary H., 3,787,226.
Iglehart, Jesse H.; and Iglehart, Hilary H., to Spinning Pipe Service, Inc. Method of treating tubular goods while simultaneously testing the interior thereof. 3,787,226, Cl. 117-66.000.
Ijichi, Ichiro; Malda, Sajiro; Kubo, Satoru; and Tomomoto, Takamori, to Nitto Electric Industrial Co., Ltd. Photo-sensitive cross-linking agents for high molecular weight materials. 3,787,302, Cl. 204-159.200.
Illinois Tool Works, Inc.: *See*—
Marco, Leslie Stephan, 3,787,547.
Saari, Oliver E., 3,786,702.
Sygnator, Henry A., 3,786,713.
Image Analysing Computers Limited: *See*—
Pieters, Leon Andre; and Ward, David Charles, 3,787,620.
Imperial Chemical Industries, Limited: *See*—
Cheetham, John Laurence, 3,787,162.
Colchester, John Edward; and Blundell, Thomas, 3,787,426.
Gallagher, Brendan; and Last, Anthony Graham Marshall, 3,787,542.
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Imperial Industries (Kynoch) Limited: *See*—
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Inaike, Toshihiro: *See*—
Ishii, Takami; Yoshikawa, Toshio; Inaike, Toshihiro; Kuroda, Kazuhiro; Kido, Kunio; and Tokunaga, Kiyoaki, 3,787,353.
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Industrial Industries, Inc.: *See*—
Wright, John David, 3,786,739.
Information Design, Inc.: *See*—
Priest, Lyle Gilbert, 3,787,004.
Ingham, Lawrence Allister. Water sprinkler. 3,786,991, Cl. 239-236.000.
Inoura, Masato: *See*—
Kimura, Kanbei; and Inoura, Masato, 3,786,719.
Institut de Recherches Chimiques et Biologiques Appliquee (I.R.C.E.B.A.): *See*—
Debat, Jacques, 3,787,507.
Institut Francais du Petrole des Carburants et Lubrifiants: *See*—
Lebreton, Francisque, 3,786,894.
Sugier, Andre, 3,787,332.
Institut Fur Harterei-Technik: *See*—
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Institute Europeen de Recherches et d'Applications Medicales "I.E.R.A.M.": *See*—
Tourin, Andre Marcel, 3,786,805.
Institute of Gas Technology: *See*—
Fleming, Donald Kingsley; Randhava, Sarabjit Singh; and Camara, Elias Humberto, 3,787,468.
Institutul Pentru Creatic Stiintifica Si Technica: *See*—
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Meyers, Laverne H.; Kagele, Frank L.; Trent, Edward J.; Fridenberg, Jerry T.; Alberty, Frederick J.; and Fitzgerald, Bloyce D. (said Kagele, said Meyers, said Trent, said Fridenberg and Alberty assors. to), 3,787,660.
International Basic Economy Corporation: *See*—
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International Business Machines Corporation: *See*—
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Fischer, Walter; Mastai, Aldo Josef; and Rocher, Edouard Yves, 3,787,717.
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International Standard Electric Corporation: *See*—
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IRD Mechanalysis, Inc.: *See*—
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Isenberg, Don Lee: *See*—
Davis, Randall Scott; and Isenberg, Don Lee, 3,787,289.
Isenberg, Sampson. Beta activated ultraviolet radiation source surrounded by a visible light producing fluorescent agent. 3,787,684, Cl. 250-71.00r.
Ishida, Akihiko: *See*—
Himizu, Junichi; Harigaya, Shoichi; Ishida, Akihiko; Yoshikawa, Kaoru; and Sato, Masanori, 3,787,448.
Ishida, Toshiaki: *See*—
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Ishii, Takami; Yoshikawa, Toshio; Inaike, Toshihiro; Kuroda, Kazuhiro; Kido, Kunio; and Tokunaga, Kiyoaki, to Ube Industries, Ltd. Stabilized polyoxymethylene compositions. 3,787,353, Cl. 260-45.90p.
Ito, Tadashi; and Sorimachi, Kanehiro, to Canon Kabushiki Kaisha. Device for adjusting the focal point of a photographic lens. 3,787,108, Cl. 350-252.000.
Itoh, Hideo: *See*—
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Itoh, Ryosuke; and Ishida, Toshiaki, to Sansui Electric Co., Ltd. Quadrasonic sound system for two channel transmission. 3,787,622, Cl. 179-1.0gq.
Ivanov, Alexandr Kornilovich: *See*—
Tesner, Pavel Alexandrovich; Makarov, Konstantin Ivanovich; Ivanov, Alexandr Kornilovich; Robin, Mark Anisimovich; Slavkin, Igor Sergeevich; Pischulin, Alexandr Petrovich; Pokrass, Leonid Mikhailovich; Pochtman, Alexandr Markovich; Sheinfain, Felix Isaakovch; Kondratiev, Evgeny Mikhailovich; Moiseevich, Grigory Isaevich; Osmaga, Igor Ivanovich; and Zhitnik, Greorgy Gavrilovich, 3,787,038.
Iwata Electric Company Limited: *See*—
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Mercola, Peter A.; and Jacobs, William R., 3,787,777.
Jacobson, Robert S., to Sperry Rand Corporation. Radio direction finder system. 3,787,862, Cl. 343-113.0de.
Jacquelin, Guy J. Corrugated cardboard containing sulphur foam. 3,787,276, Cl. 161-137.000.
Jagel, Edward H.; and Purzycki, Joseph R. Towing ski attachment for snowmobiles and method of using same. 3,787,071, Cl. 280-28.000.
Jagenberg-Werk AG: *See*—

Heymanns, Willia, 3,786,975.
Jagodzinski, Tim G.: *See—*
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Jahn, Werner; Kampe, Wolfgang; Fauland, Erich; Juhran, Wolfgang; and Stork, Harald, to Bohringer Mannheim GmbH. Adenosine compounds and therapeutic compositions. 3,787,391, Cl. 260-211.50r.
Jakob, Horst, to Societe Financiere Francaise de Licences et Brevets. Device for the manufacture of a row of linking components for a slide fastener. 3,787,164, Cl. 425-397.000.
Jakubowski, Thaddeus, Jr., to McDonnell Douglas Corporation. Internal ejector mechanism for stacked sequentially releasable separable units. 3,787,012, Cl. 244-137.00r.
James, James R.; and Eliason, Kay E., to Atlantic Richfield Company. Fluid dispenser manipulation. 3,786,965, Cl. 222-176.000.
Janson, Eugene Ernst; and Muterspaugh, Max Ward, to RCA Corporation. Switchable antenna circuit for television providing for reception of UHF and VHF signals utilizing a single built-in monopole antenna or two external antennas. 3,787,773, Cl. 325-370.000.
Japan Natural Food Co., Ltd.: *See—*
Hagiwara, Yoshihide, 3,787,591.
Japan Ship's Machinery Development Association: *See—*
Okazaki, Takeo, 3,786,796.
Japan Synthetic Rubber Company, Limited: *See—*
Nishioka, Akinori; Kawatani, Shigeo; and Ichikawa, Mitsuo, 3,787,358.
Jarrault, Maurice Louis, to Societe Civile d'Etudes et de Recherches pour. Process for manufacturing false teeth. 3,786,565, Cl. 32-8.000.
Jarrett, Graham: *See—*
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Jaworek, Dieter, to Boehringer Mannheim GmbH. Process for the chromatographic separation of mixtures. 3,787,317, Cl. 210-31.00c.
Jefferson Chemical Company, Inc.: *See—*
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Jelicic, Ivan: *See—*
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Jessop, Harvey A.: *See—*
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Jockers, Kurt: *See—*
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Jodet, Alain; Norct, Hubert; and Demichelis, Jacques, to Etat Francais, represented by Ministere de l'Equipement et du Logement, Laboratoire Central des Ponts et Chaussees. Universal drilling machine. 3,786,874, Cl. 173-49.000.
Johannsson, Paul: *See—*
Landa, Torstein; Johannsson, Paul; and Engedal, Knud, 3,787,156.
Johns, Henry Van Dyke. Continuous fiber tennis racquet. 3,787,051, Cl. 273-73.00i.
Johns-Manville Corporation: *See—*
Rayle, Brian James; Fisher, Lester; and Smith, Harvell Morton, 3,787,194.
Johnson, Alan A.; and Alicandri, Frank P. Thermoconstrictive surgical appliance 3,786,806, Cl. 128-92.00d.
Johnson, Arthur F. Method for reduction of aluminum with improved reduction cell and anodes. 3,787,300, Cl. 204-67.000.
Johnson, Arthur F. Reduction of aluminum with improved reduction cell and anodes. 3,787,310, Cl. 204-243.00r.
Johnson, Charles S., to Baker Hydro, Inc. Heater bypass and shut-off valve. 3,786,921, Cl. 210-130.000.
Johnson, Floyd C.: *See—*
Long, George E.; Reesf, Dennis L.; and Johnson, Floyd C., 3,786,871.
Johnson, George V.; and Bergman, Charles T., to Brandt, Inc. Currency count verifier. 3,787,664, Cl. 235-92.0sb.
Johnson, J. Robert. Bicycle rack. 3,786,928, Cl. 211-5.000.
Johnson, Jerry E., to Ryan Instruments, Inc. Transportable strip chart recorder. 3,787,885, Cl. 346-136.000.
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., to Phillips Petroleum Company. Selective hydrogenation employing nickel arsenide catalyst. 3,787,511, Cl. 260-666.00a.
Johnson, Roland N.; and Anderson, Jon A., to Morton-Norwich Products, Inc. 2-p-Nitro- or p-chlorobenzamidoacetohydroxamic acid. 3,787,569, Cl. 424-229.000.
Johnson, William H., to Research Corporation. Apparatus for turgor conditioning tobacco. 3,786,818, Cl. 131-136.000.
Johnston, Earnest L.: *See—*
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Jones & Laughlin Steel Corporation: *See—*
Korchynsky, Michael; Bell, John R.; and Cover, Richard J., 3,787,250.
Jones, Charles H., to Van Brode Milling Co., Inc. Article handling device. 3,786,908, Cl. 198-33.0ab.
Jones, Donald A.; Orr, Howard S.; and Qually, Francis K., to United States Steel Corporation. Rolling mill modull. 3,786,664, Cl. 72-234.000.
Jones, Ida May: *See—*
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Jones, Robert N., to Xerox Corporation. Xerographic imaging member having photoconductive material in interlocking continuous paths. 3,787,208, Cl. 96-1.800.
Jones, Sterling B. Fastener applying tool. 3,786,550, Cl. 29-238.000.
Jorgensen, George N.: *See—*
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Joschek, Hans-Ingo: *See—*
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Joyce, Douglas D., Jr.; and Simpson, Anthony Y., to Textron, Inc. Air cushion vehicle with selectively operable surface traction means. 3,786,893, Cl. 180-119.000.
Juba, Bernard T.: *See—*
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Juhran, Wolfgang: *See—*
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Juliano, Peter C., to General Electric Company. Fluorescent screens. 3,787,238, Cl. 117-335.00r.
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Kabushiki Kaisha Suwa Seikoska: *See—*
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Kagawa, Tsuneo; Fujii, Kyoichi; Tanaka, Masao; and Tanaka, Hiroshi, to Kyowa Hakko Kogyo Co., Ltd. N-acetyl-L-glutamine aluminum salt. 3,787,466, Cl. 260-448.00r.
Kagele, Frank L.: *See—*
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Kahn, Frederic Jay: *See—*
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Kalfsbeek, James S.; Kalfsbeek, Peter C.; and Goodrich, Robert S. (said Goodrich assor. to said), 3,787,646.
Kalfsbeek, James S.; Kalfsbeek, Peter C.; and Goodrich, Robert S., said Goodrich assor. to said Kalfsbeek, James S. and Kalfsbeek, Peter C Dial telephone lock. 3,787,646, Cl. 179-189.00d.
Kalfsbeek, Peter C.: *See—*
Kalfsbeek, James S.; Kalfsbeek, Peter C.; and Goodrich, Robert S., 3,787,646.
Kallianos, Andrew G.; Warfield, Albert H.; and Simpson, Melvyn I., to Leggett & Myers Incorporated. 3,5-Disubstituted-2-hydroxyacetophenones. 3,787,501, Cl. 260-592.000.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Diphenylamines for dyeing keratinous fibers. 3,787,174, Cl. 8-11.000.
Kaltmann, Hans-Joachim, to Rheinmetall GmbH. Barrels for rifles and pistols with running lands and groves. 3,786,589, Cl. 42-78.000.
Kametani, Hiroshi, to National Research Institute for Metals, Director of. Method for hydroelectrometallurgy. 3,787,293, Cl. 204-1.00r.

Kammer, Paul A.; and Duttera, Robert B., to Teledyne, Inc. Tubular arc welding electrode. 3,787,658, Cl. 219-146.000.

Kammerl, Anton; and Steigenberger, Hasso, to Siemens Aktiengesellschaft. Method and apparatus for monitoring connections in a program controlled processing system. 3,787,635, Cl. 179-18.0es.

Kampe, Wolfgang: *See*—
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Kampf, Richard S.; and Sultzbaugh, Lisle W., to Beckman Instruments, Inc. Dual channel strip chart recorder. 3,787,878, Cl. 346-49.000.

Kamyr Aktiebolag: *See*—
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Kaneko, Yasuhisa; Komatsu, Yasuhiko; and Okada, Yasuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Cylinder head. 3,786,795, Cl. 123-193.00h.

Kantor, Ilia Solomonovich: *See*—
Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Suladze, Ippolit Davidovich; Aglitsky, Vladimir Efimovich; Kakhniashvili, Avtandil Semenovich; Kantor, Ilia Solomonovich; Dzhanelidze, Vazha Venediktovich; and Lachinov, Alexandr Alexandrovich, 3787,007.

Kapoor, Inder: *See*—
Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, 3,787,505.

Kapp, Ernst: *See*—
Rudolph, Paul; Kapp, Ernst; Kempf, Georg; and Farana, Wolf-Rudiger, 3,787,559.

Karll, Robert E.: *See*—
Piasek, Edmund J.; and Karll, Robert E., 3,787,458.

Kartte, Klaus; Jockers, Kurt; Meier, Hermann; and Taglinger, Ludwig, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for purifying sulfuric acid for the catalytic synthesis of hydroxylammonium sulfate. 3,787,563, Cl. 423-531.000.

Kashkooli, Farajollah: *See*—
Brand, Warren L.; and Kashkooli, Farajollah, 3,787,251.

Kasprzak, David P., to Celotex Corporation, The. Method of relieving strains in a wall and construction therefor. 3,786,603, Cl. 52-204.000.

Katchman, Arthur: *See*—
Bennett, James G.; and Katchman, Arthur, 3,787,362.

Kates, Frank F.; and Faber, George E., to Krun Corporation. Internal Combustion engine with modified and controlled exhaust. 3,786,635, Cl. 60-278.000.

Kato, Fumio: *See*—
Miyamura, Yoshinobu; Kato, Fumio; and Okachi, Ryo, 3,787,288.

Kato, Michio: *See*—
Kubota, Tadashi; and Kato, Michio, 3,787,768.

Kattner, Erich; and Bork, Klaus, to Siemens Aktiengesellschaft. Ink jet printer interchangeable recording head. 3,787,880, Cl. 346-75.000.

Katz, Seymour: *See*—
Harris, James P.; and Katz, Seymour, 3,787,548.

Katzen, Raphael: *See*—
Hokanson, Allan E.; Katzen, Raphael; and Schwartz, Bernard W., 3,787,586.

Kauffman, James F., to Corning Glass Works. Microwave lens antenna and method of producing. 3,787,872, Cl. 343-911.000.

Kaurman, Charles W., to Olin Corporation. Dialkyltin salts of substituted pyridine-1-oxides. 3,787,417, Cl. 260-270.00r.

Kawano, Tuyoshi: *See*—
Matsukura, Kameo; Kawano, Tuyoshi; and Kikuma, Toshio, 3,787,201.

Kawasaki, Kikuo, to Fuji Denki Seizo Kabushiki Kaisha. Tank-type gas-break circuit breaker. 3,787,648, Cl. 200-148.00j.

Kawatani, Shigeo: *See*—
Nishioka, Akinori; Kawatani, Shigeo; and Ichikawa, Mitsuo, 3,787,358.

Kaye, Saul. Method and means for assaying biological factors demonstrating quantal response. 3,787,290, Cl. 195-103.50r.

Keappler, Ernest W. Apparatus for pyrolysis of wastes. 3,787,292, Cl. 202-118.000.

Kearney & Trecker Corporation: *See*—
Kirkham, Edward E., 3,786,938.

Keipert, Hans K., to Teletype Corporation. Detent mechanism for releasably securing relatively rotatable members. 3,786,693, Cl. 74-527.000.

Keithley Instruments, Inc.: *See*—
Cath, Pieter B.; and Angeline, Gary E., 3,787,776.

Keller, Toni W.; and Tschopp, Werner H., to Spectrospin A.G. Method and apparatus for recording spin resonance spectra using two sequences of R.F. exciting pulses. 3,787,760, Cl. 324-.50r.

Kelley, Douglas M., to Euclid, Inc. Steerable load transporting vehicle. 3,786,889, Cl. 180-44.00e.

Kelly, Calvin E., to United States Steel Corporation. Sliding-gate closure construction for bottom-pour vessels. 3,786,969, Cl. 222-561.000.

Kelly, George J., Jr.: *See*—
Schroeder, Kenneth H.; and Kelly, George J., Jr., 3,787,239.

Kelman, Lloyd Sol. Audio compass. 3,786,571, Cl. 33-363.00k.

Kemer, Frederick M., to International Business Machines Corporation. Ink jet printer. 3,787,884, Cl. 346-75.000.

Kempf, Georg: *See*—
Rudolph, Paul; Kapp, Ernst; Kempf, Georg; and Farana, Wolf-Rudiger, 3,787,559.

Kenaga, Duane L.; and Hall, Richard H., to Dow Chemical Company, The. High buffing vinyl aromatic resin-wood composites. 3,787,344, Cl. 260-28.50a.

Kennametal Inc.: *See*—
Brown, Thomas A.; and Huber, Joseph B., 3,786,546.

Kennedy, Alvin B., Jr., to Catalyst Services, Inc. Method of analyzing catalyst action. 3,787,183, Cl. 23-230.00r.

Kennedy, Carl D.; Butler, Claude D.; Krehbiel, Delmar D.; and Nicks, Gene E., to Continental Oil Company. Sultone recovery. 3,787,441, Cl. 260-327.00s.

Kerb, Ulrich; Wiechert, Rudolf; Petzoldt, Karl; Kieslich, Klaus; and Kolb, Karl Heinz, to Schering Aktiengesellschaft. Novel 6a-fluoro-16a,18-dimethyl-1,4-pregnadiene-3,20-diones. 3,787,454, Cl. 260-397.450.

Ketterer, Edmund. Time-keeping device with transistor control using oscillating magnet. 3,787,783, Cl. 331-116.00m.

Keyes, Richard Martin; and Nelson, Bertel Swan, to Beatrice Foods Company. Mixing pump assembly. 3,787,145, Cl. 417-250.000.

Khardin, Alexandr Pavlovich: *See*—
Gorbunov, Boris Nikolaevich; Lukashov, Anatoly Ivanovich; Mukhortova, Tamara Ivanovna; and Khardin, Alexandr Pavlovich, 3,787,515.

Khaskin, Boris Abramovich: *See*—
Melnikov, Nikolai Nikolaevich; Khaskin, Boris Abramovich; Pershin, Grigory Nikolaevich; and Milovanova, Sofia Nikolaevna, 3,787,567.

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Kido, Kunio: *See*—
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Kiehn, Robert M., to SCI Systems, Inc. Electromagnetic wave modulation and measurement system and method. 3,786,681, Cl. 73-382.000.

Kieslich, Klaus: *See*—
Kerb, Ulrich; Wiechert, Rudolf; Petzoldt, Karl; Kieslich, Klaus; and Kolb, Karl Heinz, 3,787,454.

Kiewit, David A., to Hughes Aircraft Company. Semiconductor vidicon and process for fabircating same. 3,787,720, Cl. 317-235.00r.

Kiffmeyer, Vernon A.: *See*—
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Kikuchi, Shintaro: *See*—
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Kikuma, Toshio: *See*—
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Kim, Dong H.; and Bell, Stanley C., to American Home Products Corporation. Process for the preparation of 3-cyclo-pentene-1,1-dicarboxamide. 3,787,493, Cl. 260-557.00r.

Kimura, Kanbei; and Inoura, Masato. Hobbing cutter. 3,786,719, Cl. 90-1.600.

Kimura, Masanori: *See*—
Saito, Yuichi; Shikanu, Tokuzo; and Kimura, Masanori, 3,786,552.

Kimura, Nobuo; and Mizutani, Yukio, to Tokuyama Soda Kabushiki Kaisha and Toa Boshoku Kabushiki Kaisha. Artificial hair articles and process for the preparation thereof. 3,786,822, Cl. 132-53.000.

King, David P. Machine for finishing parts. 3,786,700, Cl. 82-1.00b.

King Instruments Corp.: *See*—
King, James L., 3,787,270.

King, James L., to King Instruments Corp. Splicing tape dispenser. 3,787,270, Cl. 156-506.000.

King, Lowell A.: *See*—
Seegmiller, David W.; and King, Lowell A., 3,787,242.

King Radio Corporation: *See*—
Schmitt, Jerry C., 3,787,671.

King, William D.; Larson, George D.; Steeoerm, Donald E.; and Winchester, Amos J., Jr., to General Electric Company. Computer controlled metal rolling mill. 3,787,667, Cl. 235-151.100.

Kira, Alexander; and Scheuring, George R., to American Standard Inc. Toilet seat. 3,786,522, Cl. 4-237.000.

Kirchheim, Jean-Jacques, to Saint-Gobain. Apparatus for the production of sheets or mats from fibers of thermoplastic material. 3,787,195, Cl. 65-9.000.

Kirillovich, Anatoly: *See*—
Shvartsman, Valery Lvovich; and Kirillovich, Anatoly, 3,787,034.

Kirkham, Edward E., to Kearney & Trecker Corporation. Reversing drive for a tool changer. 3,786,938, Cl. 214-1.0bd.

Kirschner, Robert F., to Patterson-Kelly Company, The. Water chiller and storage system. 3,786,649, Cl. 62-201.000.

Kirshner, Joseph M.: *See*—
Manion, Francis M.; and Kirshner, Joseph M., 3,786,839.

Kis, Ivan: *See*—
Menachem, Surkes; Kis, Ivan; and Nathan, Rosental, 3,787,699.

Kishel, Joseph F., to Weston Instruments, Inc. Radiation gauge for measuring fluid densities. 3,787,683, Cl. 250-43.50d.

Kishi, Saburo: *See*—
Nishinomiya, Ryuzo Ueno; Miyazaki, Tetsuya; Inamine, Shiceo; and Kishi, Saburo, 3,787,585.

Kishino, Shigeo: *See*—
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Kitai, Kiyoshi, to Kabushiki Kaisha Hattori Tokeiten. Illumination-time characteristic circuit for electric eye cameras. 3,786,733, Cl. 95-10.0ct.

Kitamoto, Tatsuji; Shimizu, Mahito; and Akashi, Goro, to Fuji Photo Co., Ltd. Process for producing ferromagnetic chromium dioxide. 3,787,564, Cl. 423-607.000.

Kitrilakis, Sotiris, to Tecna Corporation. Device for treating infants having breathing difficulties. 3,786,809, Cl. 128-191.000.

Kittredge, Thomas D.: *See—*
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Klauke, Erich: *See—*
Scholl, Hans-Joachim; Klauke, Erich; Grewe, Ferdinand; and Hammann, Ingeborg, 3,787,435.

Klaus, Kaspar. Garage for the storage of vehicles. 3,786,940, Cl. 214-16.1ed.

Kleemann, Alois: *See—*
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Klein, Walter: *See—*
Mangold, Hans; and Klein, Walter, 3,787,784.

Kleinfeld, Martin J.; and Heinrichs, Alfred J., to Uniroyal Inc. Vinyl chloride resin backed floor covering. 3,787,259, Cl. 156-78.000.

Kleinman, David Allmond: *See—*
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Klenco Corporation: *See—*
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Klere, Jean: *See—*
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Kleven, Lowell A., to Uniflo Systems Company. Pneumatic timer. 3,786,836, Cl. 137-624.200.

KMS Industries, Inc.: *See—*
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Knaak, Joachim: *See—*
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Knapp, Walter: *See—*
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Knechiges, Donald P.: *See—*
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Kneuer, Joseph George: *See—*
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Knickerbocker Company, The: *See—*
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Knopf, Kenneth K. Automobile signalling system. 3,787,808, Cl. 340-66.000.

Knorr-Bremse GmbH: *See—*
Pollinger, Hans, 3,786,763.

Kobashi, Uichiro, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake booster. 3,786,636, Cl. 60-548.000.

Kobayashi, Osamu: *See—*
Ichikawa, Yataro; Tokashiki, Michiyuki; and Kobayashi, Osamu, 3,787,480.

Kobayashi, Seiichiro, to Kabushiki Kaisha Nakamura Seisakusho. Predetermined torque release wrench. 3,786,699, Cl. 81-52.400.

Koberstein, Edgar; and Lakatos, Eduard, to Laporte Industries, Limited and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Catalyst for purification of exhaust gases from motor vehicles and industrial plants. 3,787,322, Cl. 252-465.000.

Koehly, Gerard: *See—*
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Koehring Company: *See—*
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Mistarz, Robert J., 3,786,614.

Koepp, Ronald L.; and Dudkowski, Stanley J., to National Cash Register Company, The. Method of growing mobile positive ion free SiO_2 films. 3,787,233, Cl. 117-201.000.

Kohler, Alfred; and Bauer, Kurt, to SWF Spezialfabrik fur Autozubehor Gustav Rau GmbH. Universal joint ball mounting construction. 3,787,129, Cl. 403-135.000.

Kolb, Karl Heinz: *See—*
Kerb, Ulrich; Wiechert, Rudolf; Petzoldt, Karl; Kieslich, Klaus; and Kolb, Karl Heinz, 3,787,454.

Kolpe, Vasant V.: *See—*
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Komorizono, Kunichi: *See—*
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Konczal, Wolfgang, to Siemens Aktiengesellschaft. Electric compressed gas circuit breaker. 3,787,652, Cl. 200-148.00a.

Kondoh, Ken: *See—*
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Kondratiev, Evgeny Mikhailovich: *See—*
Tesner, Pavel Alexandrovich; Makarov, Konstantin Ivanovich; Ivanov, Alexandr Kornilovich; Robin, Mark Anisimovich; Slavkin, Igor Sergeevich; Pischulin, Alexandr Petrovich; Pokrass, Leonid Mikhailovich; Pochtman, Alexandr Markovich; Sheinfain, Felix Isaakovch; Kondratiev, Evgeny Mikhailovich; Moiseevich, Grigory Isaevich; Osmaga, Igor Ivanovich; and Zhitnik, Greorgy Gavrilovich, 3,787,038.

Kopf, J. David, to David Kopf Systems. Roller pump. 3,787,148, Cl. 417-477.000.

Kopfer, Rudolph J. Mixer and applicator for fingernail repair material. 3,786,820, Cl. 132-74.500.

Koppang, Richard R.; and Burge, Harland L., Jr., to THW Inc. Burner assembly for providing reduced emission of air pollutant. 3,787,168, Cl. 431-354.000.

Korach, Irving S. Collapsible lampshade. 3,787,676, Cl. 240-108.00r.

Korchynsky, Michael; Bell, John R.; and Cover, Richard J., to Jones & Laughlin Steel Corporation. Corrosion-resistant high-strength low-alloy steels. 3,787,250, Cl. 148-12.000.

Korevaar, Geerlof Jan: *See—*
Van Dijk, Leonardus Petrus Jozef; Verhagen, Jan; Feutsch, Georg; and Korevaar, Geerlof Jan, 3,787,628.

Korolyshun, Russell T.; and Rehnborg, P. Mark, to Goodrich, B. F., Company, The. Compression testing machine. 3,786,676, Cl. 73-94.000.

Kosrow, Robert L.; and Mrowczynski, Aloizy, to Union Special Machine Company. Automatic hemming apparatus. 3,786,768, Cl. 112-143.000.

Kostelecky, Clarence L.: *See—*
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Koyama, Masaki: *See—*
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Kraemer, Sandy F. Tilt board game. 3,787,055, Cl. 273-110.000.

Krajewski, Edward: *See—*
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Kramer, Fritz, to U. F. Chemical Corporation. Fire stop between floor slab and curtain wall of building. 3,786,604, Cl. 52-232.000.

Kramer, Morton: *See—*
Carmelite, Donald D.; Kramer, Morton; and Lee, Gim F., Jr., 3,787,532.

Krapp, Wolfgang. Conductive line following device for steering a vehicle. 3,787,726, Cl. 318-587.000.

Krattner, Richard: *See—*
Dickmann, Heinz Hermann; Krattner, Richard; and Mobius, Hans-Dieter, 3,787,345.
Dickmann, Heinz Hermann; and Krattner, Richard, 3,787,346.

Krause, Erich, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Control arrangement for a flat knitting machine. 3,786,655, Cl. 66-154.000.

Krechel, Joseph L. Compressor unloader and check valve unit. 3,786,828, Cl. 137-116.000.

Krehbiel, Delmar D.: *See—*
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Krenzer, John, to Velsicol Chemical Corporation. Dialkyl acetals of 2-[3-(2-t-butyl-1,3,4-thiadiazol-5-yl) Ureido] acetaldehyde. 3,787,432, Cl. 260-306.80d.

Kress, George H.: *See—*
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Kron, Martin W., to Eastman Kodak Company. Web edge guide system. 3,786,974, Cl. 226-19.000.

Kronprinz Aktiengesellschaft: *See—*
Weegen, Lorenz; Luders, Albrecht; Brinkmann, Heinz; Herbst, Klaus; and Ernst, Gerd, 3,787,092.

Krun Corporation: *See—*
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Kubo, Satoru: *See—*
Ijichi, Ichiro; Malda, Sajiro; Kubo, Satoru; and Tomomoto, Takamori, 3,787,302.

Kubota, Hiroshi; and Suzuki, Tomohiko, to Furuno Electric Company, Limited. Collision alarming system. 3,787,845, Cl. 343-7.0ed.

Kubota, Tadashi; and Kato, Michio, to Matsushita Electric Industrial Co. Ltd. Inspection apparatus for printed circuit boards. 3,787,768, Cl. 324-158.00f.

Kuehn, Erich: *See—*
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Kugler, Fritz: *See—*
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Kugler, Manfred: *See—*
Buthe, Theo; Kugler, Manfred; and Rheinl, Lohmar, 3,786,776

Kuhn, Karl Walter; and Gallois, Jacques, to Societe d'Etudes de Machines Thermiques. Device for connecting exhaust manifold sets to the turbo-blowers of a supercharged internal-combustion engine. 3,786,630, Cl. 60-130.000.

Kukes, Charles E.: *See—*
Kukes, Charles E.; Volheim, Richard H.; and Erikson, Carl, 3,786,994.

Kukes, Charles E.; Volheim, Richard H.; and Erikson, Carl, 60% to Scott, Alan and 40% to Kukes, Charles E. Adaptor unit for use with fluid nozzles. 3,786,994, Cl. 239-569.000.

Kumiai Chemical Industry Company, Ltd.: *See—*
Nitta, Kuyata; Sugiyama, Hironari; Takita, Kiyoshi; and Itoh, Hideo, 3,787,217.

Kundo, Yoshtkazu: *See—*
Muramatsu, Tateo; Aramaki, Kuninori; and Kundo, Yoshtkazu, 3,786,637.

Kunst, Helmut Eduard, to Institut Fur Harterei-Technik. Method for the boration of titanium and titanium alloys. 3,787,245, Cl. 148-6.000.

Kunz, Peter, to Mettler Instrumente, AG. Force measuring apparatus including electromagnetic load compensation. 3,786,678, Cl. 73-141.00r.

Kunz, Peter, to Mettler Instrumente, AG. Electromagnetically-compensated balance having series connected coils. 3,786,883, Cl. 177-164.000.

Kurihara, Kazuo: *See—*
Aya, Hasahiro; Saito, Junichi; Fukazawa, Nobuo; Tamura, Tatsuo; Kurihara, Kazuo; and Norishima, Norihisa, 3,787,393.

Kurio, Noriyuki: *See—*
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Kuriyama, Shizuo: *See—*
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Kuroda, Kazuhiro: *See—*
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Kurosaki, Shigehiko; and Okamoto, Yoichiro. Process for producing a solid lubricant self-supplying-type co-deposited metal film. 3,787,294, Cl. 204-16.000.

Kurz, Adolph G. Grounding connectors for shielded cable. 3,787,797, Cl. 339-95.00r.

Kusianovich, John D. Safety step-in heel binding for skis. 3,787,062, Cl. 280-11.35t.

Kusko, Alexander: *See—*
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Kyowa Hakko Kogyo Co., Ltd.: *See—*
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Nakayama, Kiyoshi; Hagino, Hiroshi; and Yoshida, Hajime, 3,787,287.

La Barber, Joseph A. Apparatus for eviscerating poultry and the like. 3,786,535, Cl. 17-11.00r.

La France, Robert C., to Aerospace Corporation, The. Linear pulsed D.C. motor and controls therefor. 3,787,716, Cl. 318-135.000.

La Salle Steel Company: *See—*
Zavodny, George, Jr., 3,786,720.

Labana, Santokh S.; and Chang, Yun Feng, to Ford Motor Company. Self crosslinking powder coating Compositions II. 3,787,340, Cl. 260-23.0xa.

Labana, Santokh S.; and Theodore, Ares N., to Ford Motor Company. Powdered coating compositions containing a glycidyl ester copolymer, a phenolic hydroxy crosslinking agent, and a flow control agent. 3,787,520, Cl. 260-836.000.

Labana, Santokh S.; and Golovoy, Amos, to Ford Motor Company. Method of preparing a powder coating composition containing glycidyl acrylate copolymers and dicarboxylic acid crosslinking agent. 3,787,521, Cl. 260-836.000.

Lacharlotte, Pierre: *See—*
Rousselie, Claude Joseph; and Lacharlotte, Pierre, 3,786,917.

Lachaussee, Maurice; and Maigret, Andre. Method for manufacturing metallic objects from circular plates. 3,786,704, Cl. 83-39.000.

Lachinov, Alexandr Alexandrovich: *See—*
Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Suladze, Ippolit Davidovich; Aglitsky, Vladimir Efimovich; Kakhniashvili, Avtandil Semenovich; Kantor, Ilia Solomonovich; Dzhanelidze, Vazha Venediktovich; and Lachinov, Alexandr Alexandrovich, 3787,007.

Ladavas, Franco: *See—*
Peri, Cesare Augusto; Fontani, Spartaco; and Ladavas, Franco, 3,787,504.

Lademann, Ernest E.; and Iadarola, Ralph E., to Bendix Corporation, The. Combination permanent magnet torquer-eddy current damper for a gyro. 3,786,685, Cl. 74-5.500.

Lafontaine, Lucien. Electric garage door opener. 3,787,725, Cl. 318-491.000.

Lahm, Heinrich: *See—*
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Lakatos, Eduard: *See—*
Koberstein, Edgar; and Lakatos, Eduard, 3,787,322.

Lamb, John F.: *See—*
McKee, James D.; and Lamb, John F., 3,786,661.

Lamey, Melvin A. Ring size cutter. 3,786,711, Cl. 83-628.000.

Lamkins, Douglas Wayne: *See—*
Vernon, John Pershing; and Lamkins, Douglas Wayne, 3,787,138.

Land, Edwin H., to Polaroid Corporation. Color diffusion transfer color process and film with silver precipitating layer. 3,787,209, Cl. 96-3.000.

Landa, Torstein; Johannsson, Paul; and Engedal, Knud, to Allmanna Svenska Elektriska Akyribolaget. Press for treating products under high isostatic pressure. 3,787,156, Cl. 425-77.000.

Landen, William James, to Eyelet Specialty Company. Safety mechanism for a liquid-dispensing container. 3,786,964, Cl. 222-153.000.

Lander, Harry L., to Poly-Chem Industries, Inc. Process for preparing a polymer comprising reacting a metal halide with an amide followed by condensation with an aldehyde, said metal being zirconium, hafnium or titanium. 3,787,368, Cl. 260-67.60r.

Landry, Raymond H.: *See—*
Colby, Harold S.; and Landry, Raymond H., 3,787,608.

Langem, Werne Lippe: *See—*
Hauschopp, Alois; Langem, Werne Lippe; Breuer, Oswald; Ostrop, Berthold; and Steinkuhl, Bernd, 3,787,090.

Langer, Arthur W., Jr.: *See—*
Whitney, Thomas A.; and Langer, Arthur W., Jr., 3,787,496.

Lanning, Ronald L., to TRW Inc. Phase correction circuit. 3,787,775, Cl. 329-122.000.

Laporte Chemicals Limited: *See—*
Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, 3,787,503.

Laporte Industries, Limited: *See—*
Koberstein, Edgar; and Lakatos, Eduard, 3,787,322.

Larkin, Oscar L.: *See—*
Goodwin, Edwin C., Jr.; Larkin, Oscar L.; and Erni, Heinrich H., 3,787,649.

Larsen, Arthur Lee, to Marathon Oil Company. Amine/phosphate composition useful as corrosion and scale inhibitor. 3,787,319, Cl. 252-8.55e.

Larsen, Arthur Lee, to Marathon Oil Company. N-secondary-alkyl alkylene diamine salts of phosphate ester acids. 3,787,533, Cl. 260-924.000.

Larson, Byron A. Gauge for use in straightening automative frames. 3,786,572, Cl. 33-288.000.

Larson, George D.: *See—*
King, William D.; Larson, George D.; Steeoerm, Donald E.; and Winchester, Amos J., Jr., 3,787,667.

Larson, Willis A., to Magic Dot, Inc. Electronic switch apparatus sensitive to and actuated by touch. 3,787,732, Cl. 307-116.000.

Last, Anthony Graham Marshall: *See—*
Gallagher, Brendan; and Last, Anthony Graham Marshall, 3,787,542.

Lauer, Kurt: *See—*
Wittner, Hubert; and Lauer, Kurt, 3,787,311.

Laundry, Terrence H.; Luther, Richard L.; and Murray, John S., Jr., to Hughes Aircraft Company. System for discriminating between high and low speed targets. 3,787,848, Cl. 343-7.700.

Laurer, Gerard R., to United States of America, Atomic Energy Commission. Source holder collimator for encapsulating radioactive material and collimating the emanations from the material. 3,787,691, Cl. 250-272.000.

Laval, Claude C., Jr. Rack for supporting cables and the like. 3,787,016, Cl. 248-49.000.

Lawler, Craig M.: *See—*
Scarnato, Thomas J.; Gordon, Paul C.; Sorensen, Robert; and Lawler, Craig M., 3,786,620.

Lawless, William Joseph: *See—*
Farmer, Wayne David; Kneuer, Joseph George; and Lawless, William Joseph, 3,787,613.

Lawrence, Ray V.: *See—*
Berry, David A.; Bunk, Albert R.; Halbrook, Noah J.; and Lawrence, Ray V., 3,787,342.

Layton, Jack D., to Layton Manufacturing Company. Vehicle and vibrating compactor combination. 3,787,135, Cl. 404-113.000.

Layton Manufacturing Company: *See—*
Layton, Jack D., 3,787,135.

Lazar, Jeffrey M., to Honeywell Inc. Chromatography valve. 3,787,026, Cl. 251-61.100.

Lazarchik, Robert E.; Roeder, Robert S.; and Runkle, Donald R., to Sperry Rand Corporation. Dual mode radiometric system. 3,787,857, Cl. 343-100.0me.

Lazarus, Stanley David: *See—*
Crescentini, Lamberto; Wells, Rodney Lee; Lazarus, Stanley David; and Weedon, Gene Clyde, 3,787,524.

Lazzari, Jean Pierre: *See—*
Grunberg, Georges; Melnick, Igor; and Lazzari, Jean Pierre, 3,787,237.

Le Fevre, Paul Eshelman, to GTE Sylvania Incorporated. Varactor tuner band switching and signal indicating circuitry. 3,787,788, Cl. 334-14.000.

Le Nickel: *See—*
Bozec, Christian H.; Dulong, Bernard G.; and Lemarinel, Robert Y., 3,787,301.

Lebel, Constantin; and Pruvost, Pierre, to Rhone-Poulenc S.A. Dentures having a diolkylpolyoiloxane coating. 3,787,231, Cl. 117-138.80a.

Lebreton, Francisque, to Institut Francais du Petrole des Carburants et Lubrifiants. Acoustic sounding instrument. 3,786,894, Cl. 181-.5be.

Lectra Data, Inc.: *See—*
Martin, Roy A.; and Pittman, Clarence E., 3,787,662.

Lee, Gim F., Jr.: *See—*
Carmelite, Donald D.; Kramer, Morton; and Lee, Gim F., Jr., 3,787,532.

Lee, Raymond, Organization Inc., The: *See—*
Perlberg, Jack, 3,787,083.

Lee, Richard J., to Standard Oil Company. Oil-soluble condensation products of alpha-nitro alkyl chlorides and polyamino ureas, and the method of preparing same. 3,787,492, Cl. 260-553.00r.

Lee, Samuel: *See—*
Dellian, Kurt A.; and Lee, Samuel, 3,787,181.

Lee, William: *See—*
Appleby, Frank G.; Rodwan, Edmund J.; and Lee, William, 3,786,718.

Leggett & Myers Incorporated: *See—*
Kallianos, Andrew G.; Warfield, Albert H.; and Simpson, Melvyn I., 3,787,501.

Legue, Ronald L.: *See—*
Brunel, Roger L.; Fannon, Robert D.; and Legue, Ronald L., 3,786,779.

Lehmann, Claude: *See—*

Dietrich, Henri; and Lehmann, Claude, 3,787,574.
Lehmann, Hans: *See—*
Leumann, Ernst; and Lehmann, Hans, 3,787,452.
Lehnhuff, Hans F.: *See—*
Elder, George; and Lehnhuff, Hans F., 3,786,659.
Leister, Karl, to Bayer Aktiengesellschaft. Apparatus having extrusion and mixing zones. 3,787,160, Cl. 425-208.000.
Leman, Gerard: *See—*
Defebvre, Andre; Leman, Gerard; and Pouliquen, Jean-Francois, 3,787,786.
Lemarinel, Robert Y.: *See—*
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Lemay, A., Co., Inc.: *See—*
Bloxsom, Joseph Thomas, 3,786,600.
Lepper, James M., Jr., to Wehr Corporation. Light scattering particle analyzer. 3,787,122, Cl. 356-103.000.
Lerner, Irwin S., to Robins, A. H., Company, Incorporated. Intrauterine contraceptive device with scalloped edge appendages. 3,786,808, Cl. 128-130.000.
Lesclear, Robert L., to T & S Equipment Company. Dock leveler. 3,786,530, Cl. 14-71.000.
Leumann, Ernst; and Lehmann, Hans, to Ciba-Geigy Corporation. Epoxysilanes. 3,787,452, Cl. 260-348.0sc.
Lever Brothers Company: *See—*
Gadefaix, Roger; and Klere, Jean, 3,787,460.
Van der Heijden, Arnoldus; and Schutte, Leonard, 3,787,473.
Levey, Gustave S., Trustee: *See—*
Dane, Oscar; Beers, Ronald Wentworth; and Levey, Gustave Stanley, 3,787,149.
Levey, Gustave Stanley: *See—*
Dane, Oscar; Beers, Ronald Wentworth; and Levey, Gustave Stanley, 3,787,149.
Levoy's, Inc.: *See—*
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Lewis, Adolph L.: *See—*
Smiley, Vern N.; Lewis, Adolph L.; and Forbes, David K., 3,787,234.
Lewis, Donald J.: *See—*
Stephenson, Robert L.; and Lewis, Donald J., 3,786,843.
Lewis, Donald J.; and Stephenson, Robert L., to Allied Chemical Corporation. Multiple pyro system. 3,787,074, Cl. 280-150.0ab.
Lewis, Hector E., to Surgical Appliance Industries, Inc. Knee brace having torque pads for producing inward support pressure. 3,786,804, Cl. 128-80.00c.
Lewis, Theras Gordon, to Bell Telephone Laboratories, Incorporated. Time slot number compensating arrangement. 3,787,631, Cl. 179-15.0at.
Lewis, Warren J. Water detection device for fuel line. 3,787,650, Cl. 200-61.040.
Lhenry, Bernard, to Creusot-Loire. Chemical descaling apparatus for discontinuous automatic treatment of sheet metal. 3,786,824, Cl. 134-62.000.
Liepelt, Klaus, to U.S. Philips Corporation. Frequency tuner of a resonator for a klystron. 3,787,748, Cl. 315-5.460.
Lieser, Zeev: *See—*
Friedman, Robert L.; and Lieser, Zeev, 3,787,854.
Lievore, Silvano Giuseppe, to Elkhart, Bridge & Iron, Inc. Suspension system. 3,787,073, Cl. 280-124.00a.
Lightner, Joseph Campbell, Jr.: *See—*
Beers, Albert Alvin, Jr.; Stoyer, Paul Eugene; and Lightner, Joseph Campbell, Jr., 3,786,764.
Limberg, Allen Le Roy, to RCA Corporation. Apparatus for distinguishing between various FM broadcast multiplex transmission. 3,787,629, Cl. 179-15.0bt.
Lindahl, Gerbert S.: *See—*
Eshbaugh, John T.; and Lindahl, Gerbert S., 3,786,651.
Linder, Jacques Francois, to Northrop Corporation. Method of forming circuit structures by photo etching-electroforming process. 3,786,542, Cl. 29-25.170.
Linderholm, Gordon J., to Pyroil Company, Inc. Tire pump. 3,786,730, Cl. 92-169.000.
Lindner, Ernst: *See—*
Ruschig, Heinrich; Schmitt, Karl; Mohler, Werner; Gobel, Axel; and Lindner, Ernst, 3,787,411.
Lindsay, Edward W., to Vacu-Maid, Inc. Carpet sweeper. 3,786,532, Cl. 15-364.000.
Lindstrom, Bengt. Vehicle steering gear. 3,786,691, Cl. 74-493.000.
Lines, Raydon A., to Proline Industries Pty., Ltd. Hydraulic jointing press. 3,786,669, Cl. 72-453.000.
Lingens, Paul; and Martin, Gerhard, to Dynamit Nobel Aktiengesellschaft. Explosive charge with improved fragmentation effect. 3,786,752, Cl. 102-24.00r.
Linhart, Helmut; and Mueller, Helmut, to Ciba-Geigy Corporation. Stabilising of polyamides. 3,787,355, Cl. 260-45.75r.
Linke, Siegfried; Sitt, Rudiger; Horstmann, Harald; and Meng, Karl, to Bayer Aktiengesellschaft. Certain 3,4,5-triphenyl thiazol-2-ones. 3,787,431, Cl. 260-306.700.
Lipton, Thomas J., Inc.: *See—*
Sanderson, Gary Warner; and Simpson, William Shaw, 3,787,582.
List, Robert A. Debris removing apparatus. 3,786,870, Cl. 171-129.000.
Little, Jess C., to Chance, A. B., Company. Method of fabricating a field-applied gripping device. 3,786,554, Cl. 29-461.000.
Litton Systems, Inc.: *See—*
Vernon, John Pershing; and Lamkins, Douglas Wayne, 3,787,138.
Liu, Kang-Jen: *See—*
Chlanda, Frederick P.; and Liu, Kang-Jen, 3,787,304.
Lockheed Electronics Company, Inc., mesne: *See—*
Norris, Kermit A., 3,787,826.
Lockheed Missiles & Space Company: *See—*
Nelson, Stanley Oscar, 3,786,888.
Loewe-Opta GmbH: *See—*
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Logan, Russell H.: *See—*
Cragon, Harvey; and Logan, Russell H., 3,787,855.
Lohrman, Glenn G.: *See—*
Graefnitz, Russell F.; and Lohrman, Glenn G., 3,787,766.
Loikitz, Frank F., to Instrument Systems Corporation. Slam-style safety lock. 3,786,657, Cl. 70-150.000.
Lojinger, Robert I. Shirt collar support. 3,786,971, Cl. 223-83.000.
Long, George E.; Reesf, Dennis L.; and Johnson, Floyd C., to Grad-Line Inc. Grader control. 3,786,871, Cl. 172-4.500.
Long, John H.: *See—*
Shaler, David; and Long, John H., 3,787,889.
Long, Martin H., Jr.; and Pachynski, Alvin L. Underwater electronic flash actuator. 3,786,734, Cl. 95-11.00w.
Longyear Company: *See—*
Schafer, Robert P.; Braun, Leonard A.; and Maki, Terrence C., 3,786,877.
Looger, Lonnie L.: *See—*
Vickers, Wiley B.; and Looger, Lonnie L., 3,786,717.
Looger, Lonnie L. Gaseous grenade. 3,786,756, Cl. 102-65.000.
Loqvist, Kaj-Ragnar, to Fagersta Aktiebolag Fagersta. Tyre stud. 3,786,849, Cl. 152-210.000.
Lord Corporation: *See—*
Moran, Michael W., 3,787,102.
L'Oreal: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,787,174.
Lorensen, Cletus E.; and Peterson, John A., to International Business Machines Corporation. Document controlled picking and feeding apparatus. 3,787,044, Cl. 271-27.000.
Losi, Salvatore: *See—*
Zuntini, Franco; Aliprandini, Giuseppe; Gioria, Jean-Michel; Meyer, Andre; and Losi, Salvatore, 3,787,463.
Lovell, Lyle M.: *See—*
Muffat, Donald L.; Clark, John B.; and Lovell, Lyle M., 3,787,189.
Lovens Kemiske Fabrik Produktionsaktieselikeb: *See—*
Feit, Peter Werner; and Nielsen, Ole Bent Tvaermose, 3,787,421.
Lowenfeld, Rudolf, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of insoluble azo dyestuffs on cellulose fibers. 3,787,179, Cl. 8-45.000.
Lowy, George W.; Conlon, Joseph M.; and Marcus, Byron E., to Baxter Laboratories, Inc. Multiple function spectrophotometer having an automatically stabilized chopped disc. 3,787,121, Cl. 356-93.000.
Lowy, George W.; Priarone, Paul; and Cullis, Herbert M., to Baxter Laboratories, Inc. Dual wavelength photometer for absorbance difference measurements. 3,787,124, Cl. 356-205.000.
Loyen, Ghislaine, nee Voisin: *See—*
Habermann, Helmut; Loyen, Roger; Joly, Pierre; Auber, Yvan; and Malmaison, Rueil, 3,787,100.
Loyen, Roger: *See—*
Habermann, Helmut; Loyen, Roger; Joly, Pierre; Auber, Yvan; and Malmaison, Rueil, 3,787,100.
Lubrizol Corporation, The: *See—*
Adams, Charles Wesley, 3,787,374.
Lucas, Joseph, (Industries), Limited: *See—*
Freeman, Frank George, 3,786,726.
Lucas, Peter K., to Garrett Corporation, The. Cable drum highline system. 3,787,031, Cl. 254-172.000.
Lucking, Hans Joachim; Noll, Walter; Buchner, Werner; Friederich, Klaus; and Niederprum, Hans, to Bayer Aktiengesellschaft. Perfluoro-alkane-sulphonamido substituted organo-silicon compounds and their production. 3,787,467, Cl. 260-448.80r.
Luders, Albrecht: *See—*
Weegen, Lorenz; Luders, Albrecht; Brinkmann, Heinz; Herbst, Klaus; and Ernst, Gerd, 3,787,092.
Ludwig, Eugene A. Device for cutting urethane foam. 3,786,701, Cl. 83-1.000.
Lukashov, Anatoly Ivanovich: *See—*
Gorbunov, Boris Nikolaevich; Lukashov, Anatoly Ivanovich; Mukhortova, Tamara Ivanovna; and Khardin, Alexandr Pavlovich, 3,787,515.
Lunden, Clarence D.: *See—*
Buehler, Walter E.; and Lunden, Clarence D., 3,787,841.
Lundgren, Evert Gustav, to Sandvikens Vernverks Aktiebolag. Cutting insert. 3,786,540, Cl. 29-95.000.
Lundgren, Evert Gustav, to Sandvikens Vernverks Aktiebolag. Cutting inserts having two-stage chipbreaker. 3,786,541, Cl. 29-95.00r.
Luther, Richard L.: *See—*
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Lyle, Don M.: *See—*
Hauck, Erwin A.; Lyle, Don M.; and Wollum, James E., 3,787,816.
Lyle, Donald D.: *See—*
Bryson, Wilmer G., Jr.; Lyle, Donald D.; and Wilda, Jack S., 3,787,035.

Lyon, Charles E., Jr., to Motorola, Inc. Magnetic tape reproducting device. 3,787,058, Cl. 274-4.000.

Lyon, George W., to Dow Chemical Company, The. Apparatus for catalytic reactions. 3,787,188, Cl. 23-288.00r.

Lyons, John H. Apparatus and method for the self-examination of certain conditions of the eye. 3,787,112, Cl. 351-18.000.

Lythe, Trevor Wilkinson: *See*—
Briggs, Charles Clifford; and Lythe, Trevor Wilkinson, 3,787,558.

Ma, Lawrence K. C., to United States of America, Navy. Method of assembling transducer acoustically coupled by silicone grease. 3,786,553, Cl. 29-169.500.

MacDonald, Kenneth Donald. Apparatus for ensuring or encouraging the wearing of safety belts in vehicles. 3,787,804, Cl. 340-52.00e.

MacDowell, Warren L.; and Nailos, William F., to Namac Research Laboratories, Inc. Discone antenna. 3,787,865, Cl. 343-703.000.

MacGregor, Douglas: *See*—
Senior, Franklin C.; and MacGregor, Douglas, 3,787,306.

Machacek, Jiri: *See*—
Casensky, Bohuslav; Machacek, Jiri; and Vit, Jaroslav, 3,787,450.

Machek, John A., to Wagner Electric Corporation. Anti-skid mechanism. 3,786,722, Cl. 91-26.000.

Mack Trucks, Inc.: *See*—
Pelizzoni, Winton J.; Greathouse, Jack F.; Pekar, Frank J., Jr.; and Gibson, Richard R., 3,786,792.

Mackin, Wilson Joseph, to Greenleaf Holdings, Limited. Sawmill log indexing device. 3,786,712, Cl. 83-708.000.

MacMillan, Robert E., to McCord Corporation. Unitary bushing construction. 3,787,103, Cl. 308-26.000.

Macy, Carl L. Barrel knot tying device. 3,787,081, Cl. 289-17.000.

Madland, Thorvald: *See*—
Galbarzyk, Leslie L.; Ross, Irving D., Jr.; and Madland, Thorvald, 3,786,599.

Magic Dot, Inc.: *See*—
Larson, Willis A., 3,787,732.

Magne, Frank C.: *See*—
Mod, Robert R.; Magne, Frank C.; and Skau, Evald L., 3,787,455.
Mod, Robert R.; Magne, Frank C.; and Skau, Evald L., 3,787,456.
Mod, Robert R.; Magne, Frank C.; and Skau, Evald L., 3,787,457.

Magnoni, Franco: *See*—
Siclari, Francesco; Magnoni, Franco; and Fulmini, Sergio, 3,787,481.

Magnuson, Lee T.; and Kusko, Alexander, to Deere & Company. Vehicular drive system with electric assist. 3,787,723, Cl. 318-230.000.

Mah, Raymond W., to Dow Chemical Company, The. Epoxides of alkoxy-substituted tri (hydroxyphenyl)alkanes. 3,787,451, Cl. 260-348.00r.

Maher, George G., to United States of America, Agriculture. Molded articles and films. 3,787,220, Cl. 106-214.000.

Maher, Robert L., to Mossman, Donald P., Inc. Electrical switch assembly. 3,787,653, Cl. 200-153.00k.

Maigret, Andre: *See*—
Lachaussee, Maurice; and Maigret, Andre, 3,786,704.

Maistrelli, Roger, to Regu Nationale des Usines Renault. Ball-joint retainers for the pistons of hydraulic motors and pumps. 3,787,128, Cl. 403-135.000.

Majestic Lures: *See*—
Swan, Edward J., 3,786,586.

Makarov, Konstantin Ivanovich: *See*—
Tesner, Pavel Alexandrovich; Makarov, Konstantin Ivanovich; Ivanov, Alexandr Kornilovich; Robin, Mark Anisimovich; Slavkin, Igor Sergeevich; Pischulin, Alexandr Petrovich; Pokrass, Leonid Mikhailovich; Pochtman, Alexandr Markovich; Sheinfain, Felix Isaakovch; Kondratiev, Evgeny Mikhailovich; Moiseevich, Grigory Isaevich; Osmaga, Igor Ivanovich; and Zhitnik, Greorgy Gavrilovich, 3,787,038.

Maki, Terrence C.: *See*—
Schafer, Robert P.; Braun, Leonard A.; and Maki, Terrence C., 3,786,877.

Malaspina, Francis P.; Aker, Wesley E.; and Werth, John, to ESB Incorporated. Oxygen sensor. 3,787,308, Cl. 204-195.00p.

Malda, Sajiro: *See*—
Ijichi, Ichiro; Malda, Sajiro; Kubo, Satoru; and Tomomoto, Takamori, 3,787,302.

Male, Charles Colin; and Wallis, John Melvin, to Northern Electric Company Limited. Automatic number identification for private telephone exchanges. 3,787,632, Cl. 179-18.0ffh.

Malenge, Pierre, to S.A. Dite Societe d'Exploitation des Etablissements Malenge. Continuous strip envelopes. 3,786,984, Cl. 229-69.000.

Mallavarapu, Leo X., to Reichhold Chemicals, Inc. Resinous compositions and method for producing same. 3,787,347, Cl. 260-30.4ep.

Mallory, P. R., & Company, Inc.: *See*—
Zaleski, John, 3,787,243.

Malmaison, Rueil: *See*—
Habermann, Helmut; Loyen, Roger; Joly, Pierre; Auber, Yvan; and Malmaison, Rueil, 3,787,100.

Manganaro, George F., to Electro-Matic Staplers, Inc., mesne. Electromagnetic stapler. 3,786,978, Cl. 227-8.000.

Mangels, Robert H.: *See*—
DePriester, Donald Jack; Horney, David C.; and Mangels, Robert H., 3,787,064.

Mangold, Hans; and Klein, Walter, to Grundig E.M.V. Elektro-Mechanische and Versuchsanstalt Max Grundig. Circuit arrangement for applying a temperature stabilized voltage to a voltage sensitive component. 3,787,784, Cl. 331-177.00v.

Manheim, Jay. Pilfer proof display unit for pack merchandise. 3,786,927, Cl. 211-4.000.

Manion, Francis M.; and Kirshner, Joseph M., to United States of America, Army. High input impedance flueric amplifier. 3,786,839, Cl. 137-837.000.

Manning, Lindley; and Schneider, Richard N. Nitrogen vapor engine. 3,786,631, Cl. 60-26.000.

Manning, Robert E.: *See*—
Anderson, Paul L.; and Manning, Robert E., 3,787,410.

Manoogian, Alex; and Pollen, Eric V., to Masco Corporation. Aerator spray attachment for faucets. 3,786,995, Cl. 239-428.500.

Marans, Nelson S., to Grace, W. R., & Company. Rust preventative compositions. 3,787,227, Cl. 117-75.000.

Marathon Oil Company: *See*—
Coleman, John R., Jr., 3,787,318.
Larsen, Arthur Lee, 3,787,319.
Larsen, Arthur Lee, 3,787,533.

Marcel, Jean-Pierre Julien: *See*—
Denis, Jean Francois; Ozauba-Lyndis, Serge Yvan; Fremont, Maurice Henri Louis; Krajewski, Edward; and Marcel, Jean-Pierre Julien, 3,787,657.

Marco, Leslie Stephan, to Illinois Tool Works, Inc. Method of manufacturing a reformed plastic article. 3,787,547, Cl. 264-249.000.

Marcum, Arthur D.: *See*—
Morrow, Robert S.; Penn, Lloyd D.; and Marcum, Arthur D., 3,787,765.

Marcus, Byron E.: *See*—
Lowy, George W.; Conlon, Joseph M.; and Marcus, Byron E., 3,787,121.

Maremont Corporation: *See*—
Pray, Lester W.; Christeson, John H.; Prlston, Frederick A.; Sheron, Herman D.; Drake, William H.; and Anderson, Gordon C., 3,786,621.

Marhsall & Williams Company: *See*—
Hyatt, Frederick; and Coburn, Theodore Robert, 3,786,706.

Markham, Richard L.: *See*—
Vogelfanger, Elliot A.; and Markham, Richard L., 3,787,551.

Marsh Stencil Machine Company: *See*—
Rabelow, Harold H., 3,786,748.

Marston Excelsior Limited: *See*—
Wyatt, Derek Gerald; Clark, Delia Margaret; and Warne, Michael Anthony, 3,786,680.

Marstrand, Jorgen, to Atomenergikommissionen. Fuel assembly for a nuclear reactor and a nuclear reactor core comprising such fuel assemblies. 3,787,285, Cl. 176-78.000.

Martin, Gerhard: *See*—
Lingens, Paul; and Martin, Gerhard, 3,786,752.

Martin, Louis E., to Societe Anonyme Poclain. Device limiting the delivery output of a jack. 3,786,724, Cl. 91-395.000.

Martin, Roy A.; and Pittman, Clarence E., to Lectra Data, Inc. Voting Machine. 3,787,662, Cl. 235-54.00f.

Martin, Wesley G., to Aluminum Specialty Company. Corn popper. 3,786,740, Cl. 99-323.800.

Martineau, John C.: *See*—
Marzocchi, Alfred; and Martineau, John C., 3,787,352.

Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; and Kaelin, Bette Marie, 3,786,596.

Marzocchi, Alfred; and Martineau, John C., to Owens-Corning Fiberglas Corporation. Method of preparing glass fiber-elastomer compositions. 3,787,352, Cl. 260-41.0ag.

Maschinenfabrik Augsburg Nuernberg Aktiengesellschaft: *See*—
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Maschinenfabrik Rieter AG: *See*—
Hanselmann, Daniel; and Wildbolz, Rudolf, 3,787,093.

Masco Corporation: *See*—
Manoogian, Alex; and Pollen, Eric V., 3,786,995.

Masonry Systems, Inc.: *See*—
Behunin, Gage B.; Cole, Eugene A.; and Staadt, Charles R., 3,786,966.

Masonry Systems, Inc., mesne: *See*—
Staadt, Charles R., 3,786,936.

Mastai, Aldo Josef: *See*—
Fischer, Walter; Mastai, Aldo Josef; and Rocher, Edouard Yves, 3,787,717.

Master Lock Company: *See*—
Foote, Daniel J., 3,787,082.

Materese, Vincent, to Dayton Manufacturing Company. Waste treatment system with enclosed screen unit. 3,786,922, Cl. 210-136.000.

Mathiesen, Odd, to International Standard Electric Corporation. Converter for gyro-compass digital display. 3,787,835, Cl. 340-347.0sy.

Mathou, Marcel. Beds with lateral sliding panels. 3,786,524, Cl. 5-108.000.

Matsukura, Kameo; Kawano, Tuyoshi; and Kikuma, Toshio, to Nippon Steel Corporation. High tensile strength steel plate for cold-forming. 3,787,201, Cl. 75-125.000.

Matsumoto, Mitsuo, to Nara Mishin Kogyo Kabushiki Kaisha. Means for imparting tention to the drawn-out thread for sewing machines. 3,786,771, Cl. 112-255.000.

Matsumoto, Tatsuji. Continuous welding method and apparatus thereof for metal plates. 3,787,656, Cl. 219-104.000.

Matsumura, Toichi: *See*—
Hasegawa, Masanaru; Hayashi, Yoshiki; and Matsumura, Toichi, 3,787,207.

Matsuoka, Earl: *See*—
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Matsushita Electric Industrial Co. Ltd.: *See—*
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Matsushita Electric Industrial Company Ltd.: *See—*
Hasegawa, Masanaru; Hayashi, Yoshiki; and Matsumura, Toichi, 3,787,207.
Matthews, Gary J., to Syntex Corporation. Preparation of cyanohydrins. 3,787,477, Cl. 260-465.00f.
Matuzawa, Syoji: *See—*
Sugahara, Yujiro; Usui, Kouichi; Naito, Hiroyuki; and Matuzawa, Syoji, 3,787,330.
Mauyama, Takashi: *See—*
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Maxwell, Billy D.: *See—*
Schwartz, William H., Jr.; and Maxwell, Billy D., 3,786,767.
McCarthy, Lauris J. Method of making a hollow electrical contact. 3,786,558, Cl. 29-630.00a.
McCarty, John O.; and Smith, Leary W., to Audichron Company, The. Announcing system. 3,787,637, Cl. 179-100.2md.
McClocklin, Samuel B.; and Kostelecky, Clarence L., to Owatonna Tool Company. Two-stage air-hydraulic booster. 3,787,147, Cl. 417-307.000.
McCollum, Anthony W., to Eastman Kodak Company. Acetals and methods for their preparation. 3,787,397, Cl. 260-240.00e.
McCord Corporation: *See—*
MacMillan, Robert E., 3,787,103.
McCormick, Harold E., to Ramsey Corporation. Piston ring end guide. 3,787,059, Cl. 277-1.000.
McCrady, John, to Displaytek Corporation. Advancing mechanism for thermal print apparatus. 3,787,886, Cl. 346-76.00r.
McCulloch Corporation: *See—*
Gasner, William Lavier, 3,786,687.
McCullough, Edward E.: *See—*
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McDonnell Douglas Corporation: *See—*
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Ban, Thomas E., 3,787,192.
McFadden, Allan L.: *See—*
Dietz, Raymond Louis; and McFadden, Allan L., 3,787,218.
McFarland, James W., to Pfizer Inc. Method of treating helminthiasis. 3,787,578, Cl. 424-263.000.
McFarlane, Leroy F., to Coilform Company, Inc. Multi-piece coil form assembly. 3,787,799, Cl. 339-214.00r.
McGarr, John J., to USM Corporation. Manufacture of polyurethane powders using polyvinyl pyrrolidone having side chains from copolymerization with alkylated olefins. 3,787,525, Cl. 260-859.00r.
McGillvary, Daniel Ross, to Firestone Tire & Rubber Company, The. Method of curing and/or subjecting to pressure an elastomeric article. 3,787,550, Cl. 264-88.000.
McGinnis, Paul H.; McLaughlin, William D., Jr.; and Swader, Robert E., to Celanese Corporation. Process and apparatus for producing fibrous structures. 3,787,265, Cl. 156-167.000.
McGlothlin, Charles J. Wire gripping tool. 3,786,670, Cl. 72-480.000.
McGraw-Edison Company: *See—*
Renner, Earl G., 3,787,137.
McKay, Robert S.: *See—*
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McKee, Arthur G., & Company: *See—*
Greaves, Melvin J.; and Werner, Tage, 3,786,606.
McKee, James D.; and Lamb, John F., to Reynolds Metals Company. Rolling mill control system. 3,786,661, Cl. 72-19.000.
McKenzie, James H., Sr. Foldable kite and rocket launching means therefor. 3,787,013, Cl. 244-155.00r.
McKinney, Charles R.: *See—*
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McLaughlin, William D., Jr.: *See—*
McGinnis, Paul H.; McLaughlin, William D., Jr.; and Swader, Robert E., 3,787,265.
McLoughlin, John. Nozzle pressure control system. 3,786,869, Cl. 169-24.000.
McNeil Laboratories, Inc.: *See—*
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Mead Corporation, The: *See—*
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Duffield, Peter Leonard, 3,787,881.
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Medical Innovations, Inc.: *See—*
Hagopian, Nubar D.; and Colman, John M., 3,786,802.
Medicus, Gostav K.; and Breaux, Onezime P., to United States of America, Air Force. External cathode/internal anode figure eight laser. 3,787,781, Cl. 331-94.50d.
Mehring, Lucien L., to Danly Machine Corporation. Shield assembly for router. 3,786,846, Cl. 144-251.000.
Meiboom, Saul: *See—*
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Meier, Hermann: *See—*
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Melacini, Paolo; Patron, Luigi; Moretti, Alberto; and Tedesco, Raffaele, to Montefibre S.p.A. Process for the bulk polymerization of acrylonitrile. 3,787,365, Cl. 260-63.00n.
Melkersson, Karl-Axel; and Hedenas, Bo Gustav Valter, to Boliden Aktiebolag. Method of purifying gases containing mercury compounds and elementary mercury. 3,786,619, Cl. 55-72.000.
Mellen, George P.; and Schuster, William A., to United States of America, Army. Self-destruct fuze. 3,786,759, Cl. 102-71.000.
Mellowes, Charles N.: *See—*
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Melnick, Igor: *See—*
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Melnikov, Nikolai Nikolaevich; Khaskin, Boris Abramovich; Pershin, Grigory Nikolaevich; and Milovanova, Sofia Nikolaevna. Octadadecylammonium diethoxydithiophosphate used in the treatment of dermatomycoses. 3,787,567, Cl. 424-199.000.
Menachem, Surkes; Kis, Ivan; and Nathan, Rosental, to State of Israel, Atomic Energy Commission, The. Rotary drum for storing radio-active objects. 3,787,699, Cl. 250-307.000.
Meng, Karl: *See—*
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Mennen Company, The: *See—*
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Meranshian, George; Sutter, Raymond C.; Nimylowycz, Osyp; and White, Wilmer, to United States of America, Army. Inflating apparatus. 3,787,010, Cl. 244-146.000.
Merck & Co., Inc.: *See—*
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Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
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Mercola, Peter A.; and Jacobs, William R., to Beltone Electronics Corporation. Electric amplifier. 3,787,777, Cl. 330-15.000.
Merle, Jean, to Societe Grenobloise d'Etudes et d'Applications Hydrauliques, (SOGREAH). Underwater rotatable tool equipment. 3,786,875, Cl. 173-159.000.
Metallgeschaft Aktiengesellschaft: *See—*
Rudolph, Paul; Kapp, Ernst; Kempf, Georg; and Farana, Wolf-Rudiger, 3,787,559.
Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, to University of Illinois Foundation. Insecticidal biodegradable analogues of DDT. 3,787,505, Cl. 260-612.00r.
Mettler Instrumente AG: *See—*
Allenspach, Heinz, 3,786,884.
Kunz, Peter, 3,786,678.
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Meyer, Andre: *See—*
Zuntini, Franco; Aliprandini, Giuseppe; Gioria, Jean-Michel; Meyer, Andre; and Losi, Salvatore, 3,787,463.
Meyer, Heinz; Schmid, Dieter; Bei, Pullach; Schwarzer, Hans; and Twittenhoff, Hans Joachim, to Elektrochemische Werke Munich AG. Process for the setting of unsaturated polyester resins. 3,787,527, Cl. 260-861.000.
Meyer, Martin R.: *See—*
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Meyers, Laverne H.; Kagele, Frank L.; Trent, Edward J.; Fridenberg, Jerry T.; Alberty, Frederick J.; and Fitzgerald, Bloyce D., said Kagele, said Meyers, said Trent, said Fridenberg and Alberty assors. to Intercontinental Services, Inc. Game control system. 3,787,660, Cl. 235-61.90r.
Miale, Joseph N.: *See—*
Haag, Werner O.; and Miale, Joseph N., 3,787,517.
Michaels, Alan S., to Alza Corporation. Drug delivery device with self actuated mechanism for retaining device in selected area. 3,786,813, Cl. 128-260.000.
Microsystems International Limited: *See—*
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Middelkamp, Mannes Arie: *See—*
De Jong, Nicolaas Johannes; and Middelkamp, Mannes Arie, 3,787,792.
Mikofalvy, Bela K.; and Knechiges, Donald P., to Goodrich, B. F., Company, The. Low temperature curing polymers used as coatings for fibrous materials. 3,787,232, Cl. 117-155.0ua.

Milazzo, Carl J., to Hohl Machine & Conveyor Co., Inc. Accumulating transfer conveyor. 3,786,911, Cl. 198-219.000.

Milchem Incorporated: *See*—
Greenfield, George L., 3,787,488.

Miller, Edward F.: *See*—
Hellmuth, Walter W.; and Miller, Edward F., 3,787,497.

Miller, Frank E.; and Sulcek, Charles E., to Whirlpool Corporation. Refuse compactor support structure. 3,786,744, Cl. 100-229.00a.

Miller, Jack E.; and Garrett, Kenneth M. Seine assembly. 3,786,592, Cl. 43-6.500.

Miller, Joseph Charles: *See*—
Appenzeller, Henry Albert; Miller, Joseph Charles; and Shea, Vincent, 3,786,660.

Miller, Lester, to Bangor Punta Operations, Inc. Articulated trailer hitch. 3,787,068, Cl. 280-446.00r.

Miller, Lyle Eugene: *See*—
Rathe, Robert Allyn; and Miller, Lyle Eugene, 3,786,872.

Mills, Warren L. Postage estimator and puller. 3,786,885, Cl. 177-245.000.

Milovanova, Sofia Nikolaevna: *See*—
Melnikov, Nikolai Nikolaevich; Khaskin, Boris Abramovich; Pershin, Grigory Nikolaevich; and Milovanova, Sofia Nikolaevna, 3,787,567.

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Minagawa, Nobuhiko, to Fuji Photo Film Company, Ltd. Process for undercoating a support of photographic material. 3,787,214, Cl. 96-87.00r.

Minnesota Mining & Manufacturing Company: *See*—
Olson, Maynard H., 3,787,351.

Minnesota Mining and Manufacturing Company: *See*—
Dahlquist, Carl A.; and Kolpe, Vasant V., 3,787,531.
Fayling, Richard E., 3,787,839.
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Delaquila, Gary; and Bercier, John R., 3,786,585.

Mischenko, Nicholas, to Bell & Howell Company. Dual reel drive. 3,787,003, Cl. 242-192.000.

Mishima Kosan Company, Ltd.: *See*—
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Mistarz, Robert J., to Koehring Company. Container filling and capping apparatus. 3,786,614, Cl. 53-167.000.

Mitchell, William Alexander; Stahl, Howard Dave; and Seidel, William Charles, to General Foods Corporation. Fixed volatile flavors and method for making same. 3,787,592, Cl. 426-380.000.

Mitsubishi Kinzoku Kogyo Kabushiki Kaisha: *See*—
Saito, Yuichi; Shikanu, Tokuzo; and Kimura, Masanori, 3,786,552.

Mitsui Shipbuilding and Engineering Company, Ltd.: *See*—
Okazaki, Takeo, 3,786,796.

Mitsuyama, Masaru; and Kurio, Noriyuki, to Toyo Kogyo Company, Ltd. Oil seal construction for rotary internal combustion engine. 3,787,152, Cl. 418-142.000.

Miyamura, Yoshinobu; Kato, Fumio; and Okachi, Ryo, to Kyowa Hakko Kogyo Co., Ltd. Method for preparing alpha-aminobenzylpenicillin. 3,787,288, Cl. 195-36.00p.

Miyaoka, Minoru: *See*—
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Miyazaki, Tetsuya: *See*—
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Mizuhara, Howard; and Gamer, Nicholas T., to Western Gold & Platinum Company. Method of making brazing alloy. 3,786,854, Cl. 164-80.000.

Mizusawa Kagaku Kogyo Kabushiki Kaisha: *See*—
Sugahara, Yujiro; Usui, Kouichi; Naito, Hiroyuki; and Matuzawa, Syoji, 3,787,330.

Mizutani, Yukio: *See*—
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Mizzoni, Renat Herbert; and Blatter, Herbert Morton. Pyridisis sulfonic acids as diuretics. 3,787,573, Cl. 424-263.000.

Mobil Oil Corporation: *See*—
Haag, Werner O.; and Miale, Joseph N., 3,787,517.

Mobius, Hans-Dieter: *See*—
Dickmann, Heinz Hermann; Krattner, Richard; and Mobius, Hans-Dieter, 3,787,345.

Mochizuki, Tetsuya, to Hope Kabushiki Kaisha. Ski boot. 3,786,581, Cl. 36-2.5al.

Mod, Robert R.; Magne, Frank C.; and Skau, Evald L., to United States of America, Agriculture. Vinyl chloride plastic compositions and certain plasticizers therefore. 3,787,455, Cl. 260-404.000.

Mod, Robert R.; Magne, Frank C.; and Skau, Evald L. Vinyl chloride plastic compositions and certain plasticizers therefore. 3,787,456, Cl. 260-404.000.

Mod, Robert R.; Magne, Frank C.; and Skau, Evald L. Vinyl chloride plastic compositions and certain plasticizers therefore. 3,787,457, Cl. 260-404.000.

Modine Manufacturing Company: *See*—
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Mohler, Werner: *See*—
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Mohr, John L.: *See*—
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Moilliet, John Lewis: *See*—
Greenshields, James Nairn; Jones, Ida May; Moilliet, John Lewis; and Poole, Victor David, 3,787,173.

Moiseevich, Grigory Isaevich: *See*—
Tesner, Pavel Alexandrovich; Makarov, Konstantin Ivanovich; Ivanov, Alexandr Kornilovich; Robin, Mark Anisimovich; Slavkin, Igor Sergeevich; Pischulin, Alexandr Petrovich; Pokrass, Leonid Mikhailovich; Pochtman, Alexandr Markovich; Sheinfain, Felix Isaakovch; Kondratiev, Evgeny Mikhailovich; Moiseevich, Grigory Isaevich; Osmaga, Igor Ivanovich; and Zhitnik, Greorgy Gavrilovich, 3,787,038.

Molitor, Bernard A., to Nu-Pro Corporation. Lock and key light. 3,787,677, Cl. 240-2.130.

Molnar, Michael J., to ABC Bending Enterprises. Bending tool. 3,786,663, Cl. 72-220.000.

Monsanto Company: *See*—
Dobinson, Frank; and Pelezo, Chris A., 3,787,348.
Heimsch, Robert A.; Bartosczewicz, John S.; and Slocombe, Robert J., 3,787,212.
Mottus, Edward H.; and Ort, Morris R., 3,787,383.
Ridgway, James S.; and Pickett, Oscar A., Jr., 3,787,373.

Montecatini Edison S.p.A.: *See*—
Peri, Cesare Augusto; Fontani, Spartaco; and Ladavas, Franco, 3,787,504.

Montefibre S.p.A.: *See*—
Melacini, Paolo; Patron, Luigi; Moretti, Alberto; and Tedesco, Raffaele, 3,787,365.

Moore, Brian B.; Padegs, Andris; and Smith, Ronald M., to International Business Machines Corporation. Signal processor instruction for non-blocking communication between data processing units. 3,787,891, Cl. 340-172.500.

Moorman, Charles J.; Meyer, Martin R.; and Reuter, Frederick A., to Mosler Safe Company, The. Magnetically encoded card reader and/or writer. 3,787,661, Cl. 235-61.11d.

Moran, Michael W., to Lord Corporation. Stabilized tubular compressive load carrying laminated bearing. 3,787,102, Cl. 308-26.000.

Morehead, Edward A.: *See*—
Finley, Donald L.; and Morehead, Edward A., 3,786,574.

Morel, Jacques, to Rhone-Poulenc S.A. Process for preparing 3'-oxoretinene. 3,787,498, Cl. 260-586.00b.

Moretti, Alberto: *See*—
Melacini, Paolo; Patron, Luigi; Moretti, Alberto; and Tedesco, Raffaele, 3,787,365.

Morford, Marvin A. Mouse trap. 3,786,591, Cl. 43-66.000.

Morita, Hideo: *See*—
Aishima, Itsuho; Sakurai, Hisaya; Takashi, Yukichi; Morita, Hideo; Hirotsu, Yoshiyuki; and Hamada, Tetsuo, 3,787,323.

Morrill, Robert J.: *See*—
Diersing, Raymond A.; Morrill, Robert J.; and Stanback, Harris I., 3,787,713.

Morrow, Robert S.; Penn, Lloyd D.; and Marcum, Arthur D., to IRD Mechanalysis, Inc. Direct reading phase meter. 3,787,765, Cl. 324-83.00a.

Morton, Ralph B.: *See*—
Frye, James A.; and Morton, Ralph B., 3,787,161.

Morton, Robert D.; and Grohoski, Edward G., to Hartford Special Machinery Company, The. Pointer for multiple size work blanks. 3,786,527, Cl. 10-169.000.

Morton-Norwich Products, Inc.: *See*—
Johnson, Roland N.; and Anderson, Jon A., 3,787,569.

Mosler Safe Company, The: *See*—
Moorman, Charles J.; Meyer, Martin R.; and Reuter, Frederick A., 3,787,661.

Mosly, Wilbur C., Jr.: *See*—
Dahlen, Burton L.; Mosly, Wilbur C., Jr.; Smith, Paul K.; and Albenesius, Edward L., 3,787,321.

Mossman, Donald P., Inc.: *See*—
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Motooka, Motozo. Carburation system. 3,787,037, Cl. 261-130.000.

Motorola, Inc.: *See*—
Lyon, Charles E., Jr., 3,787,058.

Mottus, Edward H.; and Ort, Morris R., to Monsanto Company. Polymerization of olefinic compounds and catalysts therefor. 3,787,383, Cl. 260-92.80r.

Mowatt-Larssen, Erling, to General American Transportation Corporation. Manway cover for tank cars. 3,786,955, Cl. 220-55.00e.

Moyher, William G.: *See*—
Eckstein, George R.; and Moyher, William G., 3,786,755.

Mrowczynski, Aloizy: *See*—
Kosrow, Robert L.; and Mrowczynski, Aloizy, 3,786,768.

Muehldorf, Eugen Igor, to International Business Machines Corporation. Test pattern generator. 3,787,669, Cl. 235-152.000.

Mueller, Charles P.; and Ecer, Gunes M., to Cyclops Corporation. High temperature chromium-nickel alloy. 3,787,202, Cl. 75-134.00f.

Mueller, Helmut: *See*—
Linhart, Helmut; and Mueller, Helmut, 3,787,355.

Muffat, Donald L.; Clark, John B.; and Lovell, Lyle M., to Standard Oil Company. Apparatus for mixing fluids in a vessel between beds of solids. 3,787,189, Cl. 23-288.00r.

Muirhead, Inc.: *See*—
Shaler, David; and Long, John H., 3,787,889.

Mukai, Hisakazu, to Nippon Telephone and Telephone Public Corporation. High speed/logic circuit. 3,787,737, Cl. 307-215.000.

Mukhortova, Tamara Ivanovna: *See*—

Gorbunov, Boris Nikolaevich; Lukashov, Anatoly Ivanovich; Mukhortova, Tamara Ivanovna; and Khardin, Alexandr Pavlovich, 3,787,515.

Muller, Hans, to Grapha Maschinenfabrik Hans Muller AG. Stitching machine for a stack of sheets. 3,786,979, Cl. 227-44.000.

Mumford, Ray H.: *See—*
Neeb, Robert P.; Patrick, Henry W.; and Mumford, Ray H., 3,786,736.

Mumper, Richard G., to Milwaukee Tool & Machine Co., Inc. Punch for corrugated board. 3,786,708, Cl. 83-332.000.

Muncheryan, Hrand M. Laser eraser for a typewriter. 3,786,907, Cl. 197-181.000.

Muncy, Gary O. Guitar fret board. 3,787,600, Cl. 84-314.000.

Murai, Masayuki, to Pioneer Electronic Corporation. Hall element magnetic head having integral means for detecting the amount of head material ground away during a machine operation. 3,787,638, Cl. 179-100.2ch.

Muramatsu, Tateo; Aramaki, Kuninori; and Kundo, Yoshtkazu, to Bridgestone Tire Company Limited. Oil fence. 3,786,637, Cl. 61-1.00f.

Murdoch, Henry W., to Reed Tool Company. Drill bit. 3,786,879, Cl. 175-374.000.

Murphy, Patrick J., II. Sensor system for automatic tooling. 3,786,976, Cl. 226-48.000.

Murphy, Timothy C., to Arvin Industries, Inc. Electric shears. 3,787,742, Cl. 310-50.000.

Murphy, William D.; Williams, George Norman; Wilson, Robert F.; and Zmuda, Edward I., to GTE Sylvania Incorporated. Signal transducer incorporating a multi-channel photomultiplier tube. 3,787,610, Cl. 178-5.40e.

Murphy, William D.; and Zmuda, Edward I., to GTE Sylvania Incorporated. Flying spot scanner system high voltage and horizontal deflection circuitry. 3,787,750, Cl. 315-27.0td.

Murray, John S., Jr.: *See—*
Laundry, Terrence H.; Luther, Richard L.; and Murray, John S., Jr., 3,787,848.

Muterspaugh, Max Ward: *See—*
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Nabara, Akira: *See—*
Sato, Masamich; and Nabara, Akira, 3,787,873.

Nacci, George R.; and Toole, Richard C., to Du Pont de Nemours, E. I., and Company. Dry magnetic copying process. 3,787,877 Cl. 346-74.0mt.

Nadelson, Jeffrey: *See—*
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Nadir, Mark T.: *See—*
Abramson, Carl Newton; and Nadir, Mark T., 3,787,627.

Nagatomi, Rikio: *See—*
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Nailos, William F.: *See—*
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Naito, Hiroyuki: *See—*
Sugahara, Yujiro; Usui, Kouichi; Naito, Hiroyuki; and Matuzawa, Syoji, 3,787,330.

Naka, Kanji; Sugiyama, Masayasu; and Nishibori, Saiko, to Ono Pharmaceutical Company, Ltd. 10-Carbamoyl-phenothiazine-3-sulfonamide. 3,787,413, Cl. 260-243.00a.

Nakahara, Ryoji: *See—*
Hayashida, Hidenori; and Nakahara, Ryoji, 3,787,296.

Nakamura, Takaharu: *See—*
Hamano, Sachiyuki; Nakamura, Takaharu; Kuriyama, Shizuo; and Yamanaka, Motosuke, 3,787,440.

Nakamura, Yoshiro; and Nagatomi, Rikio, to Nippon Zeon Co., Ltd. Process for vulcanizing polyepihalohydrin rubbers. 3,787,376, Cl. 260-79.000.

Nakashio, Seizo; Takemura, Toshio; Mauyama, Takashi; Ota, Kunio; and Seto, Tetsuki, to Sumitomo Chemical, Limited. Process for production of polyphenylene oxide compounds. 3,787,361, Cl. 260-47.0et.

Nakaya, Naohisa: *See—*
Uchida, Kozo; Nakaya, Naohisa; and Suzuki, Koji, 3,787,749.

Nakayama, Kiyoshi; Hagino, Hiroshi; and Yoshida, Hajime, to Kyowa Hakko Kogyo Co., Ltd. Process for the production of L-tyrosine. 3,787,287, Cl. 195-29.000.

Nalbach, John C.; and Warner, Graeme W., to Nalbach, John R., Engineering Company. Apparatus for securing and sealing a closure cap to a receptacle. 3,786,616, Cl. 53-88.000.

Nalbach, John R., Engineering Company: *See—*
Nalbach, John C.; and Warner, Graeme W., 3,786,616.

Nalco Chemical Company: *See—*
Stanford, James R.; and Vogelsang, Paul G., Jr., 3,787,534.

Namac Research Laboratories, Inc.: *See—*
MacDowell, Warren L.; and Nailos, William F., 3,787,865.

Namenyi, Istvan: *See—*
Erdmann, Dietrich; Namenyi, Istvan; Hampel, Bruno; and Herbert, Werner, 3,787,320.

Nara Mishin Kogyo Kabushiki Kaisha: *See—*
Matsumoto, Mitsuo, 3,786,771.

Nardo, Thomas P.; and Pecoraro, Ralph R., to Universal Oil Products Company. Vent valve assembly. 3,786,829, Cl. 137-202.000.

Narean, Hale F. Solar evaporation controlled irrigation system. 3,786,832, Cl. 137-403.000.

Nathan, Rosental: *See—*
Menachem, Surkes; Kis, Ivan; and Nathan, Rosental, 3,787,699.

Nathan, Walter, to TRC Industries, Inc. Base for an upright for forming a stand or the like. 3,787,018, Cl. 248-165.000.

National Cash Register Company, The: *See—*
Bussman, Dale R.; Bell, Frederick K.; and Filsinger, David E., 3,786,973.
Emrick, Donald D., 3,787,327.
Hoover, Troy Eugene, 3,787,325.
Hoover, Troy Eugene, 3,787,412.
Koepp, Ronald L.; and Dudkowski, Stanley J., 3,787,233.

National Research Institute for Metals, Director of: *See—*
Kametani, Hiroshi, 3,787,293.

Nayar, Harbhajan S.: *See—*
Finlay, Walter L.; Nayar, Harbhajan S.; and Hay, Donald A., 3,787,200.

Naylor, Hugh E., III: *See—*
Fillmore, Gary L.; Naylor, Hugh E., III; and West, Donald L., 3,787,882.

Nearman, Richard E. Bi-directional fork apparatus. 3,786,952, Cl. 214-731.000.

Necrevergne, Georges, to Purdue Frederick Company, The. Pyrazolidone derivatives. 3,787,389, Cl. 260-210.00r.

Nedelec, Lucien; Guillaume, Jacques; and Allais, Andre, to Roussel-UCLAF. Thienobenzazephines. 3,787,445, Cl. 260-332.30p.

Nederlandse Organisatie Voor Toegepast: *See—*
Collet, Peter Jacobus, 3,786,647.

Nederlandse Organisatie Voor Tolgepast Natuurwetenschappelijk Onderjoek ten Behoeve van Nijverheid, Handel en Verkeer: *See—*
Collet, Peter Jacobus, 3,786,646.

Neeb, Robert P.; Patrick, Henry W.; and Mumford, Ray H., to Diazit Company, Inc. Diazotype developing apparatus. 3,786,736, Cl. 95-89.00r.

Neefe, Charles W. Contact lens for olar drug delivery. 3,786,812, Cl. 128-260.000.

Neer, Clifford H., to Burt Machine Company, Incorporated, mesne. Labelling machine. 3,787,267, Cl. 156-363.000.

Neff, Joseph J., to Bell & Howell Company. Tension transducer. 3,787,690, Cl. 250-231.00r.

Negishi, Eizaburo, to Kabushiki Kaisha Negishi Kogyo Kenkyusho. Yarn spinning method and apparatus therefor. 3,786,622, Cl. 57-58.890.

Negishi, Satoshi, to Tokyo Shibaura Electric Co., Ltd. Light controllable charge transfer device. 3,787,823, Cl. 340-173.01s.

Neii, Radhakrishna Murty; Sawa, Kenneth B.; and Bing, Colin C., to Beckman Instruments, Inc. Specific ion electrode and method of making said electrode. 3,787,309, Cl. 204-195.00m.

Neill, Scott E., Jr.: *See—*
Ferguson, Willie Douglas, 3,786,544.

Nelboeck-Hochstetter, Michael: *See—*
Bergmeyer, Hans Ulrich; Haid, Eric; Nelboeck-Hochstetter, Michael; and Weimann, Gunther, 3,787,392.

Nelson, Bertel Swan: *See—*
Keyes, Richard Martin; and Nelson, Bertel Swan, 3,787,145.

Nelson, Gunner E., to Ethyl Corporation. Preparation of aromatic hydrocarbons. 3,787,512, Cl. 260-668.00c.

Nelson, Paul E.; and Peterson, Russell H., to Honeywell Information Systems, Inc. Automatic diagnostic system. 3,787,670, Cl. 235-153.0ac.

Nelson, Stanley Oscar, to Lockheed Missiles & Space Company. Torque compensated walking beam. 3,786,888, Cl. 180-24.110.

Neri, Carlo; and Perrott, Emilio, to Snam Progetti S.p.A. Process for the preparation of trivalent cobalt complexes. 3,787,464, Cl. 260-439.00r.

Newell Industries Inc.: *See—*
Falk, Mervin L.; and Olah, Louis, 3,787,616.

Newman, Seymour: *See—*
Dickie, Ray A.; and Newman, Seymour, 3,787,522.

Newton, Alwin B., to Borg-Warner Corporation. Air conditioning control system. 3,786,650, Cl. 62-209.000.

Nickols, Richard C., Jr.: *See—*
Schulmeister, Lee F.; and Nickols, Richard C., Jr., 3,787,244.

Nicks, Gene E.: *See—*
Kennedy, Carl D.; Butler, Claude D.; Krehbiel, Delmar D.; and Nicks, Gene E., 3,787,441.

Nicolet Instruments, Inc.: *See—*
Schumann, Robert W.; and Smith, Arthur F., 3,787,666.

Niebylski, Leonard M., to Ethyl Corporation. Anodizing aluminum foams. 3,787,298, Cl. 204-58.000.

Niederprum, Hans: *See—*
Lucking, Hans Joachim; Noll, Walter; Buchner, Werner; Friederich, Klaus; and Niederprum, Hans, 3,787,467.

Nielsen, Ole Bent Tvaermose: *See—*
Feit, Peter Werner; and Nielsen, Ole Bent Tvaermose, 3,787,421.

Nielsen, Torben Elof, to American Danish Oticon A/S. Bearing aid device. 3,787,643, Cl. 179-107.00e.

Niileksela, Eino Ilmari. Trolling lure. 3,786,587, Cl. 43-35.000.

Nimylowycz, Osyp: *See—*
Ciccone, Thomas Q.; Hare, George F.; and Nimylowycz, Osyp, 3,786,761.
Meranshian, George; Sutter, Raymond C.; Nimylowycz, Osyp; and White, Wilmer, 3,787,010.

Nippon Electric Company, Limited: *See—*
Ochiai, Kazuo; and Araseki, Takashi, 3,787,645.
Sato, Yoichi, 3,787,762.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Okudaira, Mitsuo, 3,787,602.

Nippon Miniature Bearing Co. Ltd.: *See*—
Sato, Shigeru, 3,786,543.

Nippon Piston Ring Kabushiki Kaisha: *See*—
Owada, Akihito, 3,786,830.

Nippon Shokubai Kogyo Co., Ltd.: *See*—
Ichihara, Shoichi; Hara, Hauruichi; and Ohara, Tskashi, 3,787,333.

Nippon Steel Corporation: *See*—
Matsukura, Kameo; Kawano, Tuyoshi; and Kikuma, Toshio, 3,787,201.

Nippon Telegraph and Telephone Public Corporation: *See*—
Shimada, Sadakuni; Hashimoto, Kunio; Kondoh, Ken; and Koyama, Masaki, 3,787,787.

Nippon Telephone and Telephone Public Corporation: *See*—
Mukai, Hisakazu, 3,787,737.

Nippon Zeon Co., Ltd.: *See*—
Nakamura, Yoshiro; and Nagatomi, Rikio, 3,787,376.

Nippondenso Co., Ltd.: *See*—
Soda, Toshi; and Fujisawa, Hideya, 3,786,788.

Nisbet, John L.; and Woodall, Hubert C., Jr., to Carolina Narrow Fabric Company. Glass fabric suitable for casts, bandages, and the like. 3,787,272, Cl. 161-89.000.

Nishi, Naoichi, to Brewer Sewing Supplies Company. Overcasting foot attachment for sewing machines. 3,786,770, Cl. 112-235.000.

Nishibori, Saiko: *See*—
Naka, Kanji; Sugiyama, Masayasu; and Nishibori, Saiko, 3,787,413.

Nishikawa, Shigeru; Akami, Hitoshi; and Shibuya, Atsuo, to Director-General of Agency of Industrial Science and Technology. Method of automatically making pattern cards for jacquard looms. 3,786,987, Cl. 234-2.000.

Nishikawa, Tomio, to Concast AG. Method for controlling a continuous casting installation in the event of molten metal breakout. 3,786,856, Cl. 164-4.000.

Nishinomiya, Ryuzo Ueno; Miyazaki, Tetsuya; Inamine, Shiceo; and Kishi, Saburo. Stable lactone solution. 3,787,585, Cl. 426-212.000.

Nishioka, Akinori; Kawatani, Shigeo; and Ichikawa, Mitsuo, to Japan Synthetic Rubber Company, Limited. Process for producing polyphenylene oxides. 3,787,358, Cl. 260-47.0ct.

Nissen, Warren I.: *See*—
Dorion, Francis W., Jr.; Nissen, Warren I.; and Pomfret, Edward E., 3,786,563.

Nitta, Kuyata; Sugiyama, Hironari; Takita, Kiyoshi; and Itoh, Hideo, to Kumiai Chemical Industry Company, Ltd. Method for controlling sea organisms. 3,787,217, Cl. 106-15.0af.

Nitto Electric Industrial Co., Ltd.: *See*—
Ijichi, Ichiro; Malda, Sajiro; Kubo, Satoru; and Tomomoto, Takamori, 3,787,302.

Noguchi, Takashi. Apparatus for making a flexible closure. 3,787,269, Cl. 156-498.000.

Nohe, Heinz: *See*—
Beck, Fritz; Haufe, Juergen; and Nohe, Heinz, 3,787,299.

Noll, Walter: *See*—
Lucking, Hans Joachim; Noll, Walter; Buchner, Werner; Friederich, Klaus; and Niederprum, Hans, 3,787,467.

Noret, Hubert: *See*—
Jodet, Alain; Noret, Hubert; and Demichelis, Jacques, 3,786,874.

Norishima, Norihisa: *See*—
Aya, Hasahiro; Saito, Junichi; Fukazawa, Nobuo; Tamura, Tatsuo; Kurihara, Kazuo; and Norishima, Norihisa, 3,787,393.

Noropress GmbH Iressen und Presswerkzeuge & Co., KG: *See*—
Dischler, Helmut, 3,786,743.

Norris, Kermit A., to Lockheed Electronics Company, Inc., mesne. Split-phase adaptive decoding electronics. 3,787,826, Cl. 340-174.10h.

Northern Electric Company Limited: *See*—
Battrick, Peter Edward, 3,787,639.
Davis, Dan Bryan, 3,786,981.
Male, Charles Colin; and Wallis, John Melvin, 3,787,632.

Northrop Corporation: *See*—
Linder, Jacques Francois, 3,786,542.
Wheldon, Wilbert G., 3,787,009.

Norton Company: *See*—
Okrepkie, John; and Swiatek, Henry J., 3,787,273.

Noskin, Harold P., to Customcraft Nails, Inc. Method and kit for forming an artificial nail. 3,786,821, Cl. 132-88.500.

Nothiger, Otto: *See*—
Eigenmann, Gottfried; Kaiser, Leo E.; and Nothiger, Otto, 3,787,182.

Nouel, Jean-Paul; and Renault, Henry Emile Edouard, to U.S. Philips Corporation. Method of producing a diagnostic preparation on the basis of an iron complex labelled with 99 mTc. 3,787,565, Cl. 424-1.000.

Novak, Thaddeus J.; and Poziomek, Edward J., to United States of America, Army. Method and composition for detecting amine compounds. 3,787,184, Cl. 23-230.00r.

Novelty Tool Company, Inc., mesne: *See*—
Albrecht, Clifford C.; and Brown, Howard G., 3,786,841.

Nowack, Gerhard P.: *See*—
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 3,787,511.

Nowicki, Harry J.: *See*—
Curnow, John W.; and Nowicki, Harry J., 3,787,027.

Nowicki, Thomas; Shipp, John I.; Hines, Robin H.; and Broadbent, Thomas D., to AGA Corporation. Compensation means for polarized light electro-optical modulator. 3,787,118, Cl. 356-5.000.

Nowotny, Kurt A., to Crown Zellerbach Corporation. Nonwoven sheet structures from modified polyolefin fibers. 3,787,256, Cl. 156-62.200.

Nu-Pro Corporation: *See*—
Molitor, Bernard A., 3,787,677.

Numertap, Inc.: *See*—
Steiner, Rudolpf, 3,787,136.

Nupro Company: *See*—
Shufflebarger, Earl D.; Gallagher, Bernard J.; Simko, David M.; and Boylan, John R., 3,787,023.

N.V. Hollandse Signaalapparaten: *See*—
Busink, Hendrik, 3,787,819.

Oates, Alfred E.: *See*—
Cubbon, Robert C. P.; Braid, John E.; Oates, Alfred E.; and Preston, Ronald, 3,787,503.

Oberkirch, Wolfgang; Gunther, Peter; and Pampus, Gottfried, to Farbenfabriken Bayer Aktiengesellschaft. Process for the polymerisation with ring opening of cyclopentene. 3,787,381, Cl. 260-87.50c.

Oberster, Arthur E.: *See*—
Halasa, Adel F.; and Oberster, Arthur E., 3,787,377.

Obolentsev, Elena Romanovna: *See*—
Vorobeva, Antonina Ivanovna; Gorina, Vera Mikhailovna; and Obolentsev, Roman Dmitrievich, 3,787,502.

Obolentsev, Roman Dmitrievich: *See*—
Vorobeva, Antonina Ivanovna; Gorina, Vera Mikhailovna; and Obolentsev, Roman Dmitrievich, 3,787,502.

Obregon, Alejandro. Underground automatic parking system for vehicles. 3,786,930, Cl. 214-16.1cb.

O'Brien, Richard C., to O.K. Partnership, mesne. Document retrieval apparatus and method. 3,786,916, Cl. 209-80.500.

Occidental Petroleum Corporation: *See*—
Stewart, Robert D., 3,787,557.

Ochiai, Kazuo; and Araseki, Takashi, to Nippon Electric Company, Limited. Echo canceller having two echo path models. 3,787,645, Cl. 179-170.200.

O'Connor, Edward. Single-channel noise suppressor. 3,787,771, Cl. 325-65.000.

O'Connor, Robert J., to Eastman Kodak Company. Coating roller. 3,786,547, Cl. 29-130.000.

O'Donnell, Thomas P. Door and window check. 3,786,533, Cl. 16-82.000.

Officina Tecnomeccanica Esecuzioni e Montaggi S.p.A., (O.T.E.M.): *See*—
Reda, Glauco, 3,786,909.

O'Halloran, Michael: *See*—
Arnold, John Spencer; Beck, George Morland; Boom, Roger John; Cosserat, David Cockburn; Hodges, Kenneth James Hamer; Sandeman, Theodor Duncan; Williams, Roger Morley; and O'-Halloran, Michael, 3,787,818.

Ohara, Tskashi: *See*—
Ichihara, Shoichi; Hara, Hauruichi; and Ohara, Tskashi, 3,787,333.

Ohdan, Kyoji: *See*—
Yamada, Keisho; Umemura, Sumio; Ohdan, Kyoji; Hidaka, Mikio; Bando, Yasuo; Fukuda, Kazuo; and Sawazi, Masao, 3,787,334.

Ohio Nuclear, Inc.: *See*—
Stout, Karl J., 3,787,827.

O.K. Partnership, mesne: *See*—
O'Brien, Richard C., 3,786,916.

Oka, Isao: *See*—
Shima, Takeo; Urasaki, Takanori; and Oka, Isao, 3,787,370.

Okabe, Katsuhiko, to Kabushiki Kaisha Copal. Printing ribbon feeding mechanism in a printer. 3,786,906, Cl. 197-161.000.

Okachi, Ryo: *See*—
Miyamura, Yoshinobu; Kato, Fumio; and Okachi, Ryo, 3,787,288.

Okada, Yasuo: *See*—
Kaneko, Yasuhisa; Komatsu, Yasuhiko; and Okada, Yasuo, 3,786,795.

Okada, Yoshiyuki: *See*—
Hagimoto, Hiroshi; Arai, Torhiharu; Yoshikawa, Harutoshi; Watanabe, Mitsuo; and Okada, Yoshiyuki, 3,787,198.

Okamoto, Yoichiro: *See*—
Kurosaki, Shigehiko; and Okamoto, Yoichiro, 3,787,294.

Okazaki, Takeo, 1/2 to Mitsui Shipbuilding and Engineering Company, Ltd. and Japan Ship's Machinery Development Association. Method and apparatus for taking out piston in trunk piston engine. 3,786,796, Cl. 123-195.00r.

Okrepkie, John; and Swiatek, Henry J., to Norton Company. Low stretch sectional abrasive belts. 3,787,273, Cl. 161-87.000.

Okudaira, Mitsuo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with surrounding light sensitive musical effect control. 3,787,602, Cl. 84-1.240.

Olah, Louis: *See*—
Falk, Mervin L.; and Olah, Louis, 3,787,616.

Olde, Jarl Rune. Watering valve. 3,786,785, Cl. 119-75.000.

Olin Corporation: *See*—
Brock, Andrew J.; and Pryor, Michael J., 3,787,249.
Kaurman, Charles W., 3,787,417.
Ready, William C.; Puig, John E.; and Van Leuwen, Bruce G., 3,787,278.

Setzer, William C.; Cheskis, Harvey P.; and Winter, Joseph, 3,787,248.

Oliver, Earl J. Shopping cart or the like. 3,787,063, Cl. 280-33.99f.

Olivetti, Ing., C., & C., S.p.A.: *See*—
Gechele, Walter; and Piazza, Bruno, 3,787,875.

Olland, Frederik Walraven, to Olland Industrie-en Handelmaatschoppij N.V. Apparatus for supplying either hot or warm water in a vending machine. 3,787,659, Cl. 219-314.000.

Olland Industrie-en Handelmaatschoppij N.V.: *See*—
Olland, Frederik Walraven, 3,787,659.

Olsen, Paul J. Laterally stabilized stepladder. 3,786,900, Cl. 182-172.000.

Olson, Maynard H., to Minnesota Mining & Manufacturing Company. Use of soluble fluoroaliphatic oligomers in resin composite articles. 3,787,351, Cl. 260-40.00r.

Ono Pharmaceutical Company, Ltd.: *See*—
Naka, Kanji; Sugiyama, Masayasu; and Nishibori, Saiko, 3,787,413.

Oomen, Joris Jan Cornelis; and Wolters, Donald Robert, to U.S. Philips Corporation. Mono-grain layer membrane. 3,787,277, Cl. 161-87.000.

Ordeco, Inc.: *See*—
Brown, Boyd E.; and Brown, Eric A., 3,786,611.

Ordway, Fred: *See*—
Smith, Robert W.; Ordway, Fred; Taylor, Charles A.; and Zimmerman, William, III, 3,786,777.

Orient Watch Co., Ltd.: *See*—
Takagi, Tooru; Shinoyama, Tsuneyoshi; and Satoh, Setsuo, 3,786,627.

Orr, Bobby J., to Allis-Chalmers Corporation. Track idler mount and recoil adjuster. 3,787,097, Cl. 305-10.000.

Orr, Bobby J., to Allis-Chalmers Corporation. Track link with eccentric seal counterbore. 3,787,098, Cl. 305-11.000.

Orr, Howard S.: *See*—
Jones, Donald A.; Orr, Howard S.; and Qually, Francis K., 3,786,664.

Ort, Morris R.: *See*—
Mottus, Edward H.; and Ort, Morris R., 3,787,383.

Osakeyhito, A. Ahlstrom: *See*—
Dorfel, Gerhard Walter, 3,786,705.

Osmaga, Igor Ivanovich: *See*—
Tesner, Pavel Alexandrovich; Makarov, Konstantin Ivanovich; Ivanov, Alexandr Kornilovich; Robin, Mark Anisimovich; Slavkin, Igor Sergeevich; Pischulin, Alexandr Petrovich; Pokrass, Leonid Mikhailovich; Pochtman, Alexandr Markovich; Sheinfain, Felix Isaakovch; Kondratiev, Evgeny Mikhailovich; Moiseevich, Grigory Isaevich; Osmaga, Igor Ivanovich; and Zhitnik, Greorgy Gavrilovich, 3,787,038.

Oster, Felix, to Fabriques de Produits Chimiques de Thenn et de Mulhouse. Process for the preparation of titanium concentrates from iron-containing titanium ores. 3,787,139, Cl. 423-610.000.

Ostrop, Berthold: *See*—
Hauschopp, Alois; Langem, Werne Lippe; Breuer, Oswald; Ostrop, Berthold; and Steinkuhl, Bernd, 3,787,090.

Ota, Kunio: *See*—
Nakashio, Seizo; Takemura, Toshio; Mauyama, Takashi; Ota, Kunio; and Seto, Tetsuki, 3,787,361.

Otterstedt, Jan-Erik Anders; and Pater, Richard, to Du Pont de Nemours, E. I., and Company. U.V.-absorbing ortho-hydroxyphenyl substituted bipyridines. 3,787,428, Cl. 260-296.00d.

Owada, Akihito, to Nippon Piston Ring Kabushiki Kaisha. Oil draining valve for a compressed air container. 3,786,830, Cl. 137-204.000.

Owatonna Tool Company: *See*—
Anderson, Richard T.; and Andrist, Willard L., 3,786,643.
McClocklin, Samuel B.; and Kostelecky, Clarence L., 3,787,147.

Owen, Kenneth. Fluidic detector for the detection of radiant energy and for the analysis of gas mixtures. 3,787,694, Cl. 250-338.000.

Owens-Corning Fiberglas Corporation: *See*—
Marzocchi, Alfred; and Martineau, John C., 3,787,352.

Owens-Corning Fiberglass Corporation: *See*—
Uffner, William E., 3,787,224.

Owens-Illinois, Inc.: *See*—
Dietz, Raymond Louis; and McFadden, Allan L., 3,787,218.
Schermerhorn, Jerry D., 3,787,106.

Oxy Metal Finishing Corporation: *See*—
Zuntini, Franco; Aliprandini, Giuseppe; Gioria, Jean-Michel; Meyer, Andre; and Losi, Salvatore, 3,787,463.

Ozauba-Lyndis, Serge Yvan: *See*—
Denis, Jean Francois; Ozauba-Lyndis, Serge Yvan; Fremont, Maurice Henri Louis; Krajewski, Edward; and Marcel, Jean-Pierre Julien, 3,787,657.

Pachynski, Alvin L.: *See*—
Long, Martin H., Jr.; and Pachynski, Alvin L., 3,786,734.

Pacific Technica Corporation: *See*—
Feldmann, Fritz K., 3,786,760.

Packard, Douglas R.: *See*—
Grossman, Leonard N.; and Packard, Douglas R., 3,787,761.

Padegs, Andris: *See*—
Moore, Brian B.; Padegs, Andris; and Smith, Ronald M., 3,787,891.

Pages, Roland, to Schlumberger Instruments et Systemes. Logic system for the processing of data delivered by nuclear detectors. 3,787,814, Cl. 340-172.500.

Paillard S.A.: *See*—
Costa, Georges, 3,786,905.

Paille, Jean: *See*—
Carre, Rene; Deauviala, Jean-Pierre; and Paille, Jean, 3,787,778.

Palma, James R. Method and apparatus for aiding severed nerves to join. 3,786,817, Cl. 128-334.00r.

Palmason, Einar H., to Parkson Industrial Equipment Company. Method of cooking comestibles. 3,787,594, Cl. 426-438.000.

Palmer, Gary Ross: *See*—
Palmer, Steven Wayne; and Palmer, Gary Ross, 3,786,778.

Palmer, Steven Wayne; and Palmer, Gary Ross. Signal device for water skiing. 3,786,778, Cl. 116-132.000.

Palmer, Warren G.: *See*—
Brink, Edwin H.; and Palmer, Warren G., 3,787,316.

Pampus, Gottfried: *See*—
Oberkirch, Wolfgang; Gunther, Peter; and Pampus, Gottfried, 3,787,381.

Pan Nova, Inc., mesne: *See*—
Young, Robert B., 3,786,960.

Pang, Michael, to American Cyanamid Company. 6-Alkyl-3-methyl quinaldinic acids. 3,787,418, Cl. 260-287.00r.

Pannier, Karl A., Jr.; Reynolds, Gordon S.; and Sorenson, James L., to Levoy's, Inc. Placement apparatus for positioning an elongated element in a body lument. 3,786,810, Cl. 128-214.400.

Paolini, Alfred P.; and Fife, Warren E., to Galion, Jeffrey, Inc. Cutting chain. 3,787,091, Cl. 299-84.000.

Pappo, Raphael: *See*—
Collins, Paul W.; and Pappo, Raphael, 3,787,449.

Park, Joseph D.; and Choi, Sam Kwon, to Minnesota Mining and Manufacturing Company. Organo-metallic derivatives of perfluorocycloalkenes. 3,787,461, Cl. 260-429.00r.

Parker, Ben H., Jr.: *See*—
Deringer, Dewitt C., 3,786,919.

Parkinson, James R. Non-contacting shaft RPM and direction of rotation measurement system. 3,787,769, Cl. 324-174.000.

Parkman, William T.: *See*—
Birkin, Michael S.; and Parkman, William T., 3,787,679.

Parkson Industrial Equipment Company: *See*—
Palmason, Einar H., 3,787,594.

Parrish, Robert Guy, to Du Pont de Nemours, E. I., and Company. Process for the preparation of low density microcellular foam sheets exhibiting high work-to-tear values. 3,787,543, Cl. 264-53.000.

Pars, Harry George; and Razdan, Raj Kumar, to Sharps Associates. Dialkylamino esters of benzopyranopyridines. 3,787,424, Cl. 260-295.00t.

Parsons, J. Hilton, Jr.: *See*—
Scott, Arthur Leslie; Parsons, J. Hilton, Jr.; and Hammond, John S., 3,787,268.

Passer, La Roy B., to USM Corporation. Mechanism for feeding washer-carrying fasteners. 3,786,980, Cl. 227-120.000.

Passler, Helmar: *See*—
Heger, Adolf; Passler, Helmar; and Patitz, Ellen, 3,787,261.

Passler, Helmar; Heger, Adolf; and Fronius, Sabine, to VEB Textilkombinat Cotthus. Process for making compound textile materials. 3,787,260, Cl. 156-84.000.

Pasturczak, Stanley: *See*—
Vogelaar, Bernard Francis; Doering, James Peter; and Pasturczak, Stanley, 3,786,891.

Patel, Arvind S.: *See*—
Story, Robert S.; and Patel, Arvind S., 3,787,014.

Patel, Ishwarlal P.: *See*—
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Pater, Richard: *See*—
Otterstedt, Jan-Erik Anders; and Pater, Richard, 3,787,428.

Patitz, Ellen: *See*—
Heger, Adolf; Passler, Helmar; and Patitz, Ellen, 3,787,261.

Patrick, Henry W.: *See*—
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Patron, Luigi: *See*—
Melacini, Paolo; Patron, Luigi; Moretti, Alberto; and Tedesco, Raffaele, 3,787,365.

Patterson, James A., to Sondell Research & Development Co. Spherical electronic components. 3,787,718, Cl. 317-234.00r.

Patterson-Kelly Company, The: *See*—
Kirschner, Robert F., 3,786,649.

Pavia, Edgar H.; and Tyagi, Amulya D., to Pavia-Byrne Engineering Corporation, mesne. Treatment of wastewaters from the processing of fish. 3,787,596, Cl. 426-488.000.

Pavia-Byrne Engineering Corporation, mesne: *See*—
Pavia, Edgar H.; and Tyagi, Amulya D., 3,787,596.

Peacher, Teddy J.: *See*—
Currie, Richard W.; and Peacher, Teddy J., 3,787,668.

Pecoraro, Ralph R.: *See*—
Nardo, Thomas P.; and Pecoraro, Ralph R., 3,786,829.

Pedersen, Niels P.; and Schultz, Henry L., Jr., to General Electric Company. Voltage control of an A.C. drive system during motor starting. 3,787,724, Cl. 318-410.000.

Pekar, Frank J., Jr.: *See*—
Pelizzoni, Winton J.; Greathouse, Jack F.; Pekar, Frank J., Jr.; and Gibson, Richard R., 3,786,792.

Pelezo, Chris A.: *See*—
Dobinson, Frank; and Pelezo, Chris A., 3,787,348.

Pelizzoni, Winton J.; Greathouse, Jack F.; Pekar, Frank J., Jr.; and Gibson, Richard R., to Mack Trucks, Inc. Variable valve timing system. 3,786,792, Cl. 123-97.00b.

Penn, Lloyd D.: *See—*
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Pennwalt Corporation: *See—*
Ferren, Richard Anthony; and Dimmig, Daniel Ashton, 3,787,379.

Penny, William C.: *See—*
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Peri, Cesare Augusto; Fontani, Spartaco; and Ladavas, Franco, to Montecatini Edison S.p.A. Process for preparing organic diperoxides. 3,787,504, Cl. 260-610.00r.

Perlberg, Jack, 20% interest to Lee, Raymond, Organization Inc., The. Safety vehicle bumper. 3,787,083, Cl. 293-88.000.

Peroxid-Chemie GmbH: *See—*
Edl, Wolfgang, 3,787,446.

Perrine, Walter E. Silencer for gas discharging devices. 3,786,895, Cl. 181-49.000.

Perrot, Robert, to Acieries de Paris & d'Ortreau. Cast steel railway crossing. 3,787,680, Cl. 246-377.000.

Perrott, Emilio: *See—*
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Pershin, Grigory Nikolaevich: *See—*
Melnikov, Nikolai Nikolaevich; Khaskin, Boris Abramovich; Pershin, Grigory Nikolaevich; and Milovanova, Sofia Nikolaevna, 3,787,567.

Peters, Tony. Liquid level control system. 3,787,733, Cl. 307-118.000.

Petersen, Everett James, Jr.: *See—*
Rohrbaugh, Donald Gene; Petersen, Everett James, Jr.; and Chase, Charles Peter, 3,787,185.

Peterson, John A.: *See—*
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Peterson, Russell H.: *See—*
Nelson, Paul E.; and Peterson, Russell H., 3,787,670.

Petulla, Laurence R.; and Fik, Harris B. Apparatus for applying therapeutic traction in progressive intermittent increase of magnitude. 3,786,803, Cl. 128-75.000.

Petzoldt, Karl: *See—*
Kerb, Ulrich; Wiechert, Rudolf; Petzoldt, Karl; Kieslich, Klaus; and Kolb, Karl Heinz, 3,787,454.

Pews, R. Garth: *See—*
Ungerug, Gary A.; Pews, R. Garth; and Dickerson, Richard T., 3,787,506.

Pezzino, Carmine. Portable canine toilet. 3,786,780, Cl. 119-1.000.

Pfizer Inc.: *See—*
Bauer, Stuart M., 3,786,615.
McFarland, James W., 3,787,578.

Pfoudler-Werke AG: *See—*
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Phillips, John J.; and Clark, Thomas A., to G & H Technology, Inc. Parachute release. 3,787,011, Cl. 244-150.000.

Phillips Petroleum Company: *See—*
Farrar, Ralph C., 3,787,510.
Gilbert, Dixie E., 3,787,170.
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 3,787,511.
Rakes, James L.; and Cooper, Wayne E., 3,786,982.
Sherk, Fred T., 3,787,487.
Stapp, Paul R., 3,787,513.

Piasek, Edmund J.; and Karll, Robert E., to Standard Oil Company. Oil-soluble aliphatic acid modified high molecular weight mannich condensation products. 3,787,458, Cl. 260-404.500.

Piazza, Bruno: *See—*
Gechele, Walter; and Piazza, Bruno, 3,787,875.

Piccolo, Luigi; Calcagno, Benedetto; and Ghirga, Marcello, to Societa Italiana Resine S.p.A. Method for preparing titanium tetrachloride. 3,787,556, Cl. 423-77.000.

Pickard, George L.: *See—*
Brown, Gaylord W.; and Pickard, George L., 3,787,158.

Pickett, Oscar A., Jr.: *See—*
Ridgway, James S.; and Pickett, Oscar A., Jr., 3,787,373.

Piel, David, to Round Dog Corporation of America. Frankfurter cutting and scoring apparatus. 3,786,703, Cl. 83-10.000.

Pierce, Irving L.: *See—*
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Pieters, Leon Andre; and Ward, David Charles, to Image Analysing Computers Limited. Density measurement by image analysis. 3,787,620, Cl. 178-7.100.

Piller, Bernhard, to Ciba-Geigy AG. Photographic material with bleachable dye. 3,787,215, Cl. 96-99.000.

Pillsbury Company, The: *See—*
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Pineno, Stephen; and Tamburro, Albert, said Pineno and said Tamburro. Method and apparatus for backfilling an underground cavity. 3,786,639, Cl. 61-35.000.

Pinior, Gernot: *See—*
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Pioneer Electronic Corporation: *See—*
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Pioneer Medical Systems, Inc.: *See—*
Hammer, Leslie G.; and Reynolds, Charles A., Jr., 3,787,767.

Pipkins, David D., to Valspar Corporation, The. Filling apparatus. 3,786,837, Cl. 137-625.320.

Pischulin, Alexandr Petrovich: *See—*
Tesner, Pavel Alexandrovich; Makarov, Konstantin Ivanovich; Ivanov, Alexandr Kornilovich; Robin, Mark Anisimovich; Slavkin, Igor Sergeevich; Pischulin, Alexandr Petrovich; Pokrass, Leonid Mikhailovich; Pochtman, Alexandr Markovich; Sheinfain, Felix Isaakovch; Kondratiev, Evgeny Mikhailovich; Moiseevich, Grigory Isaevich; Osmaga, Igor Ivanovich; and Zhitnik, Greorgy Gavrilovich, 3,787,038.

Pitt, Bruce R.: *See—*
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Pittman, Clarence E.: *See—*
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Plessey Handel und Investments AG: *See—*
Arnold, John Spencer; Beck, George Morland; Boom, Roger John; Cosserat, David Cockburn; Hodges, Kenneth James Hamer; Sandeman, Theodor Duncan; Williams, Roger Morley; and O'Halloran, Michael, 3,787,818.
Cole, Alun John; Cotton, John Michael; and Cosserat, David Cockburn, 3,787,813.

Plevyak, Joseph B. Double-chambered reciprocatable double-action-piston internal combustion engine. 3,786,790, Cl. 123-58.00c.

Plockl, Johann: *See—*
Sick, Erwin; Pinior, Gernot; and Plockl, Johann, 3,787,107.

Pluck, Rene, to Schweizerische Industrie Gesellschaft. Device for the automatic filling of biscuits into packaging containers. 3,786,617, Cl. 53-154.000.

Plumeau, Charles A., to International Telephone and Telegraph Corporation. Electronic color filter system. 3,787,609, Cl. 178-5.4st.

Plumley, Elizabeth Emmett; and Brown, David A. Smoking and cooking apparatus. 3,786,741, Cl. 99-447.000.

Pochtman, Alexandr Markovich: *See—*
Tesner, Pavel Alexandrovich; Makarov, Konstantin Ivanovich; Ivanov, Alexandr Kornilovich; Robin, Mark Anisimovich; Slavkin, Igor Sergeevich; Pischulin, Alexandr Petrovich; Pokrass, Leonid Mikhailovich; Pochtman, Alexandr Markovich; Sheinfain, Felix Isaakovch; Kondratiev, Evgeny Mikhailovich; Moiseevich, Grigory Isaevich; Osmaga, Igor Ivanovich; and Zhitnik, Greorgy Gavrilovich, 3,787,038.

Poetsch, Dieter; and Hess, Heinz, to Bosch, Robert, Fernsehanlagen GmbH. System for correcting color television signals. 3,787,611, Cl. 178-5.4ac.

Poirier, Joseph L., to United States of America, Air Force. Radar fence system. 3,787,843, Cl. 343-5.0pd.

Pokrass, Leonid Mikhailovich: *See—*
Tesner, Pavel Alexandrovich; Makarov, Konstantin Ivanovich; Ivanov, Alexandr Kornilovich; Robin, Mark Anisimovich; Slavkin, Igor Sergeevich; Pischulin, Alexandr Petrovich; Pokrass, Leonid Mikhailovich; Pochtman, Alexandr Markovich; Sheinfain, Felix Isaakovch; Kondratiev, Evgeny Mikhailovich; Moiseevich, Grigory Isaevich; Osmaga, Igor Ivanovich; and Zhitnik, Greorgy Gavrilovich, 3,787,038.

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Pollen, Eric V.: *See—*
Manoogian, Alex; and Pollen, Eric V., 3,786,995.

Pollinger, Hans, to Knorr-Bremse GmbH. Pneumatic suspension and control system for railway vehicles. 3,786,763, Cl. 105-199.00r.

Pollitzer, Ernest L.: *See—*
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Pollitzer, Ernest L., to Universal Oil Products Company. Production of high-octane, unleaded motor fuel. 3,787,313, Cl. 208-60.000.

Poly-Chem Industries, Inc.: *See—*
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Pomfret, Edward E.: *See—*
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Poole, Victor David: *See—*
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Popodko, Natalia Romanovna: *See—*
Vorobeva, Antonina Ivanovna; Gorina, Vera Mikhailovna; and Obolentsev, Roman Dmitrievich, 3,787,502.

Porret, Daniel; and Fatzer, Willy, to Ciba-Geigy AG. Diglycidyl compounds containing a N-heterocyclic ring. 3,787,405, Cl. 260-260.000.

Portescap: *See—*
Bonny, Jean-Pierre, 3,787,890.

Pott, Richard, to Precismeca Gesellschaft Fur Fordertechnik M.b.H. Article of manufacture. 3,786,549, Cl. 29-116.00r.

Potter, Robert M.; Robinson, Eugene S.; and Smith, Morton C., to United States of America, Atomic Energy Commission. Method of extracting heat from dry geothermal reservoirs. 3,786,858, Cl. 165-1.000.

Potter, Sheila Antoinette, to Imperial Chemical Industries, Limited. Process for the manufacture of bipyridyls. 3,787,427, Cl. 260-296.00d.

Potts, Herbert M.; and Trutna, Maynard A., to Container Corporation of America. Display package for elongated articles. 3,786,915, Cl. 206-45.150.

Pouliquen, Jean-Francois: *See—*
Defebvre, Andre; Leman, Gerard; and Pouliquen, Jean-Francois, 3,787,786.
Poulsen, Gene M. Turtle tray and hood (a natural habitat). 3,786,781, Cl. 119-5.000.
Powell, John Arthur, to RCA Corporation. Electron tube having internal glass member coated with crystalline ceramic material. 3,787,780, Cl. 331-94.500.
Poweray Infrared Corporation: *See—*
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Poziomek, Edward J.: *See—*
Novak, Thaddeus J.; and Poziomek, Edward J., 3,787,184.
Pratt, Richard D.; and Ewing, Kenneth W., to General Electric Company. Method for making a perforated plastic article. 3,787,546, Cl. 264-156.000.
Pray, Lester W.; Christeson, John H.; Prlston, Frederick A.; Sheron, Herman D.; Drake, William H.; and Anderson, Gordon C., to Maremont Corporation. Grapser bar positioning mechanism or automatic doffer. 3,786,621, Cl. 57-52.000.
Precismeca Gesellschaft Fur Fordertechnik M.b.H.: *See—*
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Pressman, Gerald L.; and Kittredge, Thomas D., to Electropring, Inc. Aperture controlled electrostatic image reproduction. 3,787,876, Cl. 346-74.00p.
Preston, Ronald: *See—*
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Preus, Paul. Hydrocarbon retainer for drydocks. 3,786,773, Cl. 114-45.000.
Priarone, Paul: *See—*
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Priest, Lyle Gilbert, to Information Design, Inc. Spindle braking mechanism for microfilm reader. 3,787,004, Cl. 242-204.000.
Prlston, Frederick A.: *See—*
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Procter & Gamble Company, The: *See—*
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Lines, Raydon A., 3,786,669.
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Puckette, Charles M.; Smith, Donald A.; and Butler, Walter J., to General Electric Company. Bucket brigade delay line time multiplexed MTI circuit for radar. 3,787,852, Cl. 343-7.700.
Puig, John E.: *See—*
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Putters, Robert: *See—*
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Pyrah, Patrick Frank, to British Aircraft Corporation Limited. Spherical microwave lenses. 3,787,856, Cl. 343-18.00d.
Pyroil Company, Inc.: *See—*
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Castanis, George, 3,787,599.
Rabelow, Harold H., to Marsh Stencil Machine Company. Stencil assembly with foldable adhesive covering guardian strip. 3,786,748, Cl. 101-128.100.
Radio Corporation of America: *See—*
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Rainer, Robert R. Rechargeable battery powered light. 3,787,678, Cl. 240-10.6ch.
Rakes, James L.; and Cooper, Wayne E., to Phillips Petroleum Company. Thermoformed snap closures. 3,786,982, Cl. 229-2.500.
Ralbowsky, Isivan. Illuminated pictorial display mechanism. 3,786,582, Cl. 40-31.000.
Raleigh Industries, Limited: *See—*
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Ramsey Corporation: *See—*
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Randall, David I.; Vogel, Calvin; and Wynn, Robert W., to GAF Corporation. Preparation of haloethane phosphonic acids. 3,787,486, Cl. 260-502.40r.
Randell, Forrest Thomson, to Weir Pumps, Limited. Sealed lubricating system module. 3,786,901, Cl. 184-6.180.
Randhava, Sarabjit Singh: *See—*
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Ransburg Electro-Coating Corp.: *See—*
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Raoul, Pierre, to Produits Chimiques Pecainey-Saint-Gobain. Process for the preparation of 3-acetoxy phthalide. 3,787,447, Cl. 260-343.300.
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Rasmussen, Chris Royce, to McNeil Laboratories, Inc. 3,4-Dihydro-2-(2-hydroxy)ethyl-1-(R-amino)-pyrazino (1,2-b)-1,2-benzothiazin-11(2H)-one 6,6-dioxides. 3,787,398, Cl. 260-243.00r.
Rasmussen, Chris Royce, to McNeil Laboratories, Inc. 3,4-Dihydro-1-methylpyrazino(1,2-b)-1,2-benzothiazin-11(2H)-one 6,6-dioxides. 3,787,399, Cl. 260-243.00r.
Rasmussen, Chris Royce, to McNeil Laboratories, Inc. 1,2,3,4 Tetra hydro-11-hydroxypyrazino (1,2-b)-1,2-benzothiazine-1,3-dione 6,6-dioxide. 3,787,400, Cl. 260-243.00r.
Rasmussen, Chris Royce, to McNeil Laboratories, Inc. Novel 1,2-benzothiazine dioxides. 3,787,401, Cl. 260-243.00r.
Rasmussen, Chris Royce, to McNeil Laboratories, Inc. Thio-derivatives of 1,2-benzothiazine dioxides. 3,787,402, Cl. 260-243.00r.
Rasmussen, Chris Royce, to McNeil Laboratories, Inc. Amino-derivatives of 1,2-benzothiazine dioxides. 3,787,403, Cl. 260-243.00r.
Rasmussen, Chris Royce, to McNeil Laboratories, Inc. Novel 1,2-benzothioazine dioxides and precursors therefor. 3,787,404, Cl. 260-243.00r.
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Raue, Roderich: *See—*
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Ravizza, Emanuele: *See—*
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Ray, Robert A.: *See—*
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Ray, Thomas J.; and Wachner, Glenn C., to United Aircraft Corporation. Bilateral high voltage DC system. 3,787,730, Cl. 307-77.000.
Rayle, Brian James; Fisher, Lester; and Smith, Harvell Morton, to Johns-Manville Corporation. Collection chamber for making mats of inorganic fibers. 3,787,194, Cl. 65-9.000.
Raymond, Robert E., to International Basic Economy Corporation. Filter apparatus for hydraulic system. 3,786,920, Cl. 210-90.000.
Raypak, Inc.: *See—*
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RCA Corporation: *See—*
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Powell, John Arthur, 3,787,780.
Sheng, Abel Ching Nam, 3,787,757.
Reachek, Frederick S. Pipe anchor. 3,787,131, Cl. 403-234.000.
Ready, William C.; Puig, John E.; and Van Leuwen, Bruce G., to Olin Corporation. Molded multiple density polyorethane foam. 3,787,278, Cl. 161-159.000.
Reda, Glauco, to Officina Tecnomeccanica Esecuzioni e Montaggi S.p.A., (O.T.E.M.). Pallet coupling device for chain type conveyors. 3,786,909, Cl. 198-131.000.
Reda, Kazimierz J., to Producto Machine Company, The. Clamp for rotary tables. 3,786,721, Cl. 90-58.00b.
Reed Tool Company: *See—*
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Reedy, Carl D., Jr., to Texas Instruments Incorporated. Chemical vapor deposition coatingson titanium. 3,787,223, Cl. 117-69.000.

Reese, Joe, to United States of America, Navy. Terminator for spiral antenna. 3,787,871, Cl. 343-895.000.

Reesf, Dennis L.: *See—*
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Rellinger, Oscar A. Athletic training frame with pivoted board. 3,787,049, Cl. 272-58.000.

Remington Arms Company, Inc.: *See—*
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Eckstein, George R.; and Moyher, William G., 3,786,755.

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Renfrew, Edgar Earl, to American Aniline Products, Inc. Polyester textile fibers dyed with thiazole or benzothiazole carbazole dyes. 3,787,178, Cl. 8-41.00c.

Renner, Earl G., to McGraw-Edison Company. Adjustable lock for a column mounted tool. 3,787,137, Cl. 408-241.00r.

Research Corporation: *See—*
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Resnick, Sam L.: *See—*
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Resnick, Sam L.; and Berens, Stephen, said Berens, Stephen, assor. to said Resnick, Sam L. Electronic lock and key systems employing paired key and master coding modules. 3,787,714, Cl. 317-134.000.

Retention Communication Systems, Inc.: *See—*
Catalano, Paul D.; Buten, Norman; Eash, George H.; and Emanuel, Frank V., 3,787,114.

Reuter, Frederick A.: *See—*
Moorman, Charles J.; Meyer, Martin R.; and Reuter, Frederick A., 3,787,661.

Revor, Arthur L. Air motion apparatus. 3,786,583, Cl. 40-39.000.

Reynolds, Charles A., Jr.: *See—*
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Rice, Christopher R.: *See—*
Brandt, Edison R.; and Rice, Christopher R., 3,787,636.

Rice, Milton J., to General Electric Company. Cooling system with multiple evaporators. 3,786,648, Cl. 62-200.000.

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Richter, Harvey E., to Tec Group, Inc., The. Axial flow unit. 3,786,996, Cl. 241-46.170.

Richter, Johan C. F. C., to Kamyr Aktiebolag. Device for discharging cellulosic pulp from a digester. 3,787,284, Cl. 162-246.000.

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Rickel, E. O.: *See—*
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Rieth, Kurt A., to Textron, Inc. Expansible linkage for use in making a watchband or similar article. 3,786,629, Cl. 59-79.00r.

Rinnert, Helmut Kurt, to Globe-Union Inc. Method for emptying and filling batteries and apparatus therefor. 3,786,842, Cl. 141-1.000.

Rion, James H.: *See—*
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Risko, Donald G.; Bosten, Donald R.; and Rusnak, Michael, to Rockwell International Corporation. Comminution apparatus. 3,786,998, Cl. 241-101.700.

Ritchie, Lewis M.: *See—*
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Roberge, Kenneth Joseph: *See—*
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Roberts, Cecil P., to Anchor Hocking Corporation. High speed article coding machine. 3,786,746, Cl. 101-35.000.

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Robertshaw Controls Company: *See—*
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Robinson, Joseph Gordon; and Wise, William Sydney, to Coal Industry (Patents) Limited. Treatment of coal extracts. 3,787,343, Cl. 260-28.000.

Robinson, Norman Robert, to Rolls-Royce (1971) Limited. Variable area nozzle for a gas turbine engine. 3,786,992, Cl. 239-265.390.

Rocci, Salvatore A. Limited tracking repositionable az/el turret type. 3,787,870, Cl. 343-765.000.

Rocher, Edouard Yves: *See—*
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Rohe, Ernst-Heinrich; and Raue, Roderich, to Bayer Aktiengesellschaft. Styryl dyestuffs. 3,787,476, Cl. 260-465.00d.

Rohm & Haas Company: *See—*

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Stevens, Travis E., 3,787,465.

Rohrbaugh, Donald Gene; Petersen, Everett James, Jr.; and Chase, Charles Peter, to Beckman Industries, Inc. Disruptor module. 3,787,185, Cl. 23-253.00r.

Rolls-Royce (1971) Limited: *See—*
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Rosenthal, Ben J.; and Matsuoka, Earl. Motorized wheel chair drive. 3,786,887, Cl. 180-6.500.

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Roth, Donald J., to Continental Can Company Inc. Electropneumatic or electrohydraulic cutoff, flanging and re-forming of tubing. 3,786,662, Cl. 72-55.000.

Round Dog Corporation of America: *See—*
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Royal Institution of Great Britain, The: *See—*
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Rudolph, Paul; Kapp, Ernst; Kempf, Georg; and Farana, Wolf-Rudiger, to Metallgeschaft Aktiengesellschaft. Desulfurization of water-containing hot compressed gases. 3,787,559, Cl. 423-222.000.

Ruff, Paul H.; and Schnur, Jerome C., to Tryco Manufacturing Company, Inc. Modular structure transporting apparatus. 3,786,951, Cl. 214-512.000.

Ruhchemie Aktiengesellschaft: *See—*
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Ruschig, Heinrich; Schmitt, Karl; Mohler, Werner; Gobel, Axel; and Lindner, Ernst, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Heters cyclic ethers of piperazine nalkanols. 3,787,411, Cl. 260-268.0ph.

Rushing, Wilford A.; and Sulzberger, Robert D. Signal light. 3,787,675, Cl. 240-10.6sd.

Rusnak, Michael: *See—*
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Ryan Instruments, Inc.: *See—*
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Rybak, Boris. Catheterizable multiple photometer usable in any penetrable medium. 3,787,119, Cl. 356-73.000.

Ryka Scientific, Inc.: *See—*
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Rypkema, Jouke N.: *See—*
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Saari, Oliver E., to Illinois Tool Works, Inc. Method and tooling for cutting side seal grooves. 3,786,702, Cl. 83-5.000.

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Saito, Kimio; and Fujisawa, Yutaka. Rotary casting method of killed steel. 3,786,855, Cl. 164-126.000.

Saito, Kiyoshi, to Hitachi, Ltd. Laminated iron core of rotary electric machines. 3,787,744, Cl. 310-217.000.

Saito, Yuichi; Shikanu, Tokuzo; and Kimura, Masanori, to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha. Method of manufacturing a composite bimetallic sleeve for a die-casting machine. 3,786,552, Cl. 29-420.500.

Sakurai, Hisaya: *See—*
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Salomon, Georges Pierre Joseph. Ski binding with lateral release. 3,787,070, Cl. 280-11.35t.

Salton, Frank G.; and Silverstein, Abraham, to United States of America, Navy. Delay timer. 3,787,740, Cl. 307-293.000.

Sandeman, Theodor Duncan: *See—*
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Sanders, Louis J. Anti-sway bar. 3,787,077, Cl. 280-446.00b.

Sanderson, Andrew G. Refractory furnace. 3,787,172, Cl. 432-250.000.

Sanderson, Gary Warner; and Simpson, William Shaw, to Lipton, Thomas J., Inc. A pectinase enzyme treating process for preparing high bulk density tea powders. 3,787,582, Cl. 426-50.000.

Sandler, Merton. Pharmaceutical compositions and methods of treatment. 3,787,581, Cl. 424-319.000.

Sandoz Ltd.: *See—*
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Sansui Electric Co., Ltd.: *See—*
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Sarich, Tony Ralph. Rotary motor. 3,787,150, Cl. 418-61.000.

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Sato, Hisao: *See—*
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Sato, Takashi, to Pioneer Electronic Corporation. Automatic telephone answering apparatus with confirmation of answer grip length for midcycle switching. 3,787,625, Cl. 179-6.00r.

Sato, Yoichi, to Nippon Electric Company Limited. Self-adaptive equalizer for quadrature amplitude modulated signals. 3,787,762, Cl. 325-42.000.

Satoh, Setsuo: *See—*
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Sauer, Richard W. Portable golf bag stand. 3,787,017, Cl. 248-96.000.

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Sawa, Kenneth B.: *See—*
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Schaeffer, Charles H. Connector assembly and method of use. 3,787,606, Cl. 174-65.00r.

Schafer, Robert P.; Braun, Leonard A.; and Maki, Terrence C., to Longyear Company. Soil sampler apparatus. 3,786,877, Cl. 175-249.000.

Scharfe, Gerhard: *See—*
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Schaub, Franz; and Speth, Sebastian, to Ruhchemie Aktiengesellschaft. Process for the thermal treatment of rubber and other plastic materials. 3,787,166, Cl. 431-11.000.

Schenavar, Harold E.; and Pierce, Irving L. Gripper for elongated members. 3,786,537, Cl. 24-134.00r.

Scheppe, John J.; and Carini, Raymond N., to Helme Products, Inc. Method of and a device for controlling the process temperature in an air stream drying system. 3,786,573, Cl. 34-10.000.

Schera, Enos L., Jr. Safety sledge-hammer. 3,786,847, Cl. 145-29.00r.

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Scott, Arthur Leslie; Parsons, J. Hilton, Jr.; and Hammond, John S., to Shakespeare Company. Hank forming machine for a pole construction and a method of forming a pole. 3,787,268, Cl. 156-425.000.
Scott, Clarence A., Jr., to Beneficial Insect Control, Inc. Method of raising and handling wasps. 3,786,594, Cl. 43-124.000.
Seabase, Paul L., to United States of America, Army. Apparatus for controlling charging of storage batteries with sensing the D.C. of the electrolyte. 3,787,754, Cl. 320-43.000.
Seals, William O., to United States of America, Army. Pressure sensitive mine insensitive to water deactivation. 3,786,751, Cl. 102-8.000.
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Searle, G. D., & Co.: *See—*
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Weier, Richard M., 3,787,396.
Seattle Manufacturing Corporation: *See—*
Clark, James R.; and Gearheard, Larry P., 3,786,579.
Sedin, James W., to Ryka Scientific, Inc. F.M. transmitter employing magnetically modulated ferrimagnetic resonator. 3,787,772, Cl. 325-171.000.
Sedova, Vera Nikolaevna: *See—*
Vorobeva, Antonina Ivanovna; Gorina, Vera Mikhailovna; and Obolentsev, Roman Dmitrievich, 3,787,502.
Seegmiller, David W.; and King, Lowell A. Electrochemical cell with aluminum electrodes and different electrolyte concentration in two compartments. 3,787,242, Cl. 136-83.00t.
Segelhorst, August L. Drilling control device. 3,786,864, Cl. 166-187.000.
Seglin, Leonard; and Gray, Charles A., to FMC Corporation. Production of water gas. 3,787,193, Cl. 48-204.000.
Seidel, Hans-Georg: *See—*
Becker, Kurt; and Seidel, Hans-Georg, 3,786,707.
Becker, Kurt; and Seidel, Hans-Georg, 3,787,196.
Seidel, William Charles: *See—*
Mitchell, William Alexander; Stahl, Howard Dave; and Seidel, William Charles, 3,787,592.
Seiden, Myron A., to Polaroid Corporation. Photographic apparatus. 3,786,735, Cl. 95-49.000.
Seidensticker, Horst. Apparatus for de-burring or chamfering of gears. 3,786,601, Cl. 51-129.000.
Sele, Georges J. F. Medical appliance. 3,786,523, Cl. 5-81.00b.
Semon, Albert L. Rotary plug valve. 3,787,028, Cl. 251-317.000.
Senior, Franklin C.; and MacGregor, Douglas, to Cationic Corporation. Process for the concurrent recovery of acid and metal values from spent pickle acid containing the same. 3,787,306, Cl. 204-105.00r.
Servicemaster Hospital Corporation: *See—*
De Boer, Harry F.; and Spowart, Joseph A. N., 3,787,072.
Setcom Corporation: *See—*
Santori, Charles M., 3,787,641.
Seto, Tetsuki: *See—*
Nakashio, Seizo; Takemura, Toshio; Mauyama, Takashi; Ota, Kunio; and Seto, Tetsuki, 3,787,361.
Setzer, William C.; Cheskis, Harvey P.; and Winter, Joseph, to Olin Corporation. Process for preparing aluminum alloys. 3,787,248, Cl. 148-11.50a.
Sgrillo, John J., to Farrington Company, The. Latch seat for knitting needle. 3,786,654, Cl. 66-121.000.
Shakespeare Company: *See—*
Scott, Arthur Leslie; Parsons, J. Hilton, Jr.; and Hammond, John S., 3,787,268.
Shaler, David; and Long, John H., to Muirhead, Inc. Facsimile recorder with guided styli. 3,787,889, Cl. 346-139.00a.
Shamaly, Thomas P., to USM Corporation. Explosive fastener driving tool. 3,786,977, Cl. 227-8.000.
Shank, Gerald G., to Textron, Inc. Snowmobile muffler and header assembly. 3,786,890, Cl. 180-64.00a.
Shank, John W.: *See—*

Barker, Robert A.; and Shank, John W., 3,787,800.

Sharp, John David, to Foseco International, Limited. Electrodes for arc furnaces. 3,787,336, Cl. 252-511.000.

Sharps Associates: *See—*
Pars, Harry George; and Razdan, Raj Kumar, 3,787,424.

Shavel, Joh, Jr.: *See—*
Zinnes, Harold; Schwartz, Martin L.; and Shavel, Joh, Jr., 3,787,324.

Shaw, John, to Glevum Industrial Designers Limited. Buoyancy weighing scales. 3,786,882, Cl. 177-207.000.

Shea, Vincent: *See—*
Appenzeller, Henry Albert; Miller, Joseph Charles; and Shea, Vincent, 3,786,660.

Shedrow, Sidney. Eyeglasses, and mounting means therefor. 3,787,113, Cl. 351-43.000.

Sheeley, Donald R.; Rion, James H.; Cook, William R.; and Biggs, William A., Jr., to Sonoco Products Company. Treatment of waste liquor from pulp production. 3,787,283, Cl. 162-36.000.

Sheesley, John M.; and Gulick, Ronald A., to Research Engineering Company. Actuator override. 3,786,728, Cl. 92-33.000.

Sheinfain, Felix Isaakovich: *See—*
Tesner, Pavel Alexandrovich; Makarov, Konstantin Ivanovich; Ivanov, Alexandr Kornilovich; Robin, Mark Anisimovich; Slavkin, Igor Sergeevich; Pischulin, Alexandr Petrovich; Pokrass, Leonid Mikhailovich; Pochtman, Alexandr Markovich; Sheinfain, Felix Isaakovch; Kondratiev, Evgeny Mikhailovich; Moiseevich, Grigory Isaevich; Osmaga, Igor Ivanovich; and Zhitnik, Greorgy Gavrilovich, 3,787,038.

Shellhause, Ronald L., to General Motors Corporation. Open center control valve. 3,787,029, Cl. 231-333.000.

Shellhause, Ronald L., to General Motors Corporation. Inertia valve in a deceleration energized load controlled brake valve. 3,787,096, Cl. 303-24.00f.

Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., to Merck & Co., Inc. Substituted phenylsulfamyl salicylic acids and derivatives thereof in the treatment of inflammation. 3,787,570, Cl. 424-233.000.

Sheng, Abel Ching Nam, to RCA Corporation. Circuit for supplying regulated power upon demand. 3,787,757, Cl. 323-4.000.

Shepheard, William L. Sheet metal door with foam plastic core. 3,786,613, Cl. 52-619.000.

Sherk, Fred T., to Phillips Petroleum Company. Preparation of metal salt slurries from metal salt solutions. 3,787,487, Cl. 260-515.00p.

Sherman, Frederick A., to GTE Information Systems, Incorporated. System for transferring data. 3,787,820, Cl. 340-172.500.

Sheron, Herman D.: *See—*
Pray, Lester W.; Christeson, John H.; Prlston, Frederick A.; Sheron, Herman D.; Drake, William H.; and Anderson, Gordon C., 3,786,621.

Shibuya, Atsuo: *See—*
Nishikawa, Shigeru; Akami, Hitoshi; and Shibuya, Atsuo, 3,786,987.

Shields, Ross Bisbee, to Atomic Energy of Canada, Limited. Neutron and gamma flux detector. 3,787,697, Cl. 250-390.000.

Shikanu, Tokuzo: *See—*
Saito, Yuichi; Shikanu, Tokuzo; and Kimura, Masanori, 3,786,552.

Shima, Takeo; Urasaki, Takanori; and Oka, Isao, to Teijin Limited. Process for the preparation of substantially linear polyesters of low free carboxyl group content. 3,787,370, Cl. 260-75.00r.

Shimada, Sadakuni; Hashimoto, Kunio; Kondoh, Ken; and Koyama, Masaki, to Nippon Telegraph and Telephone Public Corporation. Circular waveguide mode filter. 3,787,787, Cl. 333-98.00m.

Shimizu, Mahito: *See—*
Kitamoto, Tatsuji; Shimizu, Mahito; and Akashi, Goro, 3,787,564.

Shimizu, Tatsuro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure controls for motion picture cameras. 3,787,116, Cl. 352-141.000.

Shinoyama, Tsuneyoshi: *See—*
Takagi, Tooru; Shinoyama, Tsuneyoshi; and Satoh, Setsuo, 3,786,627.

Shipp, John I.: *See—*
Nowicki, Thomas; Shipp, John I.; Hines, Robin H.; and Broadbent, Thomas D., 3,787,118.

Shippey, Frank R.: *See—*
Block, Leo; and Shippey, Frank R., 3,786,925.

Shufflebarger, Earl D.; Gallagher, Bernard J.; Simko, David M.; and Boylan, John R., to Nupro Company. Bellows valve. 3,787,023, Cl. 251-335.00b.

Shull, Robert W., to Anchor Hocking Corporation. Closure cap liner. 3,786,954, Cl. 215-40.000.

Shvartsman, Valery Lvovich; and Kirillovich, Anatoly. Device for continuous mixing of powdered materials. 3,787,034, Cl. 259-3.000.

S.I.C.A. "Pomanjou": *See—*
Rousselie, Claude Joseph; and Lacharlotte, Pierre, 3,786,917.

Sick, Erwin; Pinior, Gernot; and Plockl, Johann, to Zellweger AG Apparate- und Maschinenfabrik Uster. Scanner apparatus for optically discernible characters. 3,787,107, Cl. 350-7.000.

Siclari, Francesco; Magnoni, Franco; and Fulmini, Sergio, to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Method for the continuous performance of esterification under thermal conditions. 3,787,481, Cl. 260-475.00p.

Siemens Aktiengesellschaft: *See—*
Kammerl, Anton; and Steigenberger, Hasso, 3,787,635.
Kattner, Erich; and Bork, Klaus, 3,787,880.
Konczal, Wolfgang, 3,787,652.
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Sievertsson, Hans: *See—*
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Signetics Corporation: *See—*
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Sigrist, Willy. Method and apparatus for measuring the weight of solid particles suspended in a carrier gas. 3,787,123, Cl. 356-103.000.

Sikorski, Robert P.: *See—*
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Silver, Allen S.: *See—*
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Silverstein, Abraham: *See—*
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Simpson, William Shaw: *See—*
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Singer Company, The: *See—*
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Sioux Steam Cleaner Corporation: *See—*
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Sir Steak Machinery, Inc.: *See—*
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Sitt, Rudiger: *See—*
Linke, Siegfried; Sitt, Rudiger; Horstmann, Harald; and Meng, Karl, 3,787,431.

Skau, Evald L.: *See—*
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Mod, Robert R.; Magne, Frank C.; and Skau, Evald L., 3,787,456.
Mod, Robert R.; Magne, Frank C.; and Skau, Evald L., 3,787,457.

Skelly, David W.; and Wagner, Bernard C., to General Electric Company. Aqueous dispersions of finely divided lubricants in polyamide acid. 3,787,338, Cl. 260-29.20n.

Skujins, Romans, Jr., to United States of America, Army. Coaxial magnetostrictive accelerometer. 3,786,674, Cl. 73-71.400.

Slama, Karel: *See—*
Dolejs, Ladislav; Beran, Pavel; Slama, Karel; and Sorm, Frantisek, 3,787,478.

Slavkin, Igor Sergeevich: *See—*
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Sletten, Carlyle J.; and Goggins, William B., Jr., to United States of America, Air Force. Airborne digital moving target detector. 3,787,849, Cl. 343-7.700.

Sletten, Carlyle J.; and Goggins, William B., Jr., to United States of America, Air Force. Airborne analog moving target detector. 3,787,850, Cl. 343-7.700.

Slocombe, Robert J.: *See—*
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Smearsoll, Wayne W.; and Kaar, John F., to Procter & Gamble Company, The. Filling containers with friable particles. 3,786,844, Cl. 141-8.000.

Smiley, Vern N.; Lewis, Adolph L.; and Forbes, David K., to United States of America, Navy. Method of producing a thin film laser. 3,787,234, Cl. 117-217.000.

Smith, Arthur F.: *See—*
Schumann, Robert W.; and Smith, Arthur F., 3,787,666.

Smith, Carl M., to Schlegel Company Canada, Limited. Core trays. 3,786,932, Cl. 211-60.00r.

Smith, Charles F.: *See—*
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Smith, Donald A.: *See—*
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Smith, Herchel: *See—*
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Smith, James M., to Hewlett-Packard Company. Coil diffusion welds in a microcircuit package assembly. 3,786,559, Cl. 29-470.100.

Smith, James P.: *See—*
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Smith Kline & French Laboratories: *See—*
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Smith, Morton C.: *See—*
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Smith, Robert W.; Ordway, Fred; Taylor, Charles A.; and Zimmerman, William, III, to Artech Corporation. Irreversible warm-up indicator. 3,786,777, Cl. 116-114.0ab.
Smith, Ronald M.: *See—*
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Smiths Industries Limited: *See—*
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Snam Progetti S.p.A.: *See—*
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Snyder, Donald E.; and Batcheller, Roy W., to Crane-Veyor Corporation. Joint for tubular structure. 3,787,033, Cl. 256-59.000.
Snyder, Herbert C.; and De Santis, Urbano J., to Brockway Glass Company, Inc. Apparatus for introducing measured volumes of gases to interiors of glass containers. 3,787,197, Cl. 65-260.000.
Soana, Renzo, to S.p.A. Luigi Franchi, Brescia (Italy). Arrangement for pre-selecting the sequence of firing of a double-barrelled gun having a single trigger. 3,786,588, Cl. 42-42.00r.
Societa Italiana Resine S.p.A.: *See—*
Piccolo, Luigi; Calcagno, Benedetto; and Ghirga, Marcello, 3,787,556.
Societe Anonyme Aerazur Constructions Aeronautiques: *See—*
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Societe Civile d'Etudes et de Recherches pour: *See—*
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Societe d'Etudes de Machines Thermiques: *See—*
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Societe Financiere Francaise de Licences et Brevets: *See—*
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Societe Grenobloise d'Etudes et d'Applications Hydrauliques, (SOGREAH): *See—*
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Denis, Jean Francois; Ozauba-Lyndis, Serge Yvan; Fremont, Maurice Henri Louis; Krajewski, Edward; and Marcel, Jean-Pierre Julien, 3,787,657.
Societe Rhone-Progil: *See—*
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Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Sauthier, Pierre, 3,786,625.
Soda, Toshi; and Fujisawa, Hideya, to Nippondenso Co., Ltd. Fuel injection apparatus for internal combustion engine. 3,786,788, Cl. 123-32.0ea.
Sol, Jack. Apparatus and method for manufacturing weld nuts. 3,786,528, Cl. 10-76.00r.
Solvay & Cie: *See—*
Stevens, Jacques; and George, Michel, 3,787,384.
Sommerfeld, Karl; and Zelldann, Herbert, to Daimler-Benz Aktiengesellschaft. Installation for defoaming lubricants. 3,786,618, Cl. 55-159.000.
Sondell Research & Development Co.: *See—*
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Keller, Toni W.; and Tschopp, Werner H., 3,787,760.
Spencer, Richard R.; and Penny, William C., to Alliance Rubber Company. Method and apparatus for forming thinwalled tubular articles. 3,787,552, Cl. 264-40.000.
Spengler, Ernst Maximilian. Rotary stamping apparatus. 3,786,709, Cl. 83-339.000.
Sperry Rand Corporation: *See—*
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Spitabny, Arnold; Breitbart, George; and Sporn, Stanley R., to Atron Industries, Inc. Remote condition monitoring device. 3,787,624, Cl. 179-2.00a.
Spontelli, Leonard P., to Crawford Fitting Company. Apparatus for testing swaged ferrules. 3,786,677, Cl. 73-88.00r.
Sporn, Stanley R.: *See—*
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Staadt, Charles R., to Masonry Systems, Inc., mesne. Overhead crane apparatus. 3,786,936, Cl. 212-11.000.
Stabilus Industrie- und Handelsgesellschaft mbH: *See—*
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Stadelhofer, Richard S. Self-feeding watering system for potted nursery plants. 3,786,598, Cl. 47-38.100.
Stafford, David C. Hidden maze puzzle contained ball. 3,787,054, Cl. 273-109.000.
Stahl, Howard Dave: *See—*
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Stamberger, Paul, to Union Optics Corporation. Polymers of N-vinyl or N-allyl heterocyclic compounds with monoethylenically unsaturated esters and glycidyl esters. 3,787,380, Cl. 260-80.720.
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Staniland, Philip Anthony; and Jarrett, Graham, to Imperial Chemical Industries, Limited. Aromatic poly sulfones. 3,787,363, Cl. 260-49.000.
Stanley, Victor William, to GKN Sankey Ltd. and Aro Plastic Building Supplies, Ltd. Moulding plastic articles. 3,787,549, Cl. 264-274.000.
Stanley Works, The: *See—*
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State of Israel, Atomic Energy Commission, The: *See—*
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States, Ronald Frederick, to Desoutter Brothers Limited. Pneumatic screwdriver or like rotary tool. 3,786,845, Cl. 144-32.000.
Stavis, Gus: *See—*
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Steigenberger, Hasso: *See—*
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Stein, John W. Electronic calculating device having arithmetic and error-checking operational modes. 3,787,672, Cl. 235-153.0bd.
Steiner, Rudolpf, to Numertap, Inc. Adjustable torque controlled tool holder. 3,787,136, Cl. 408-139.000.
Steinkuhl, Bernd: *See—*

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Stephens, Ruth E., to Ethyl Corporation. Method of decomposing nitrogen oxides. 3,787,560, Cl. 423-239.000.

Stephens, Thomas S.; Saldana, Guadalupe; and Brown, Harold E., to United States of America, Agriculture. Process for preparing carrot juice. 3,787,589, Cl. 426-325.000.

Stephenson, Charles M.: *See—*
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Stephenson, Kenrick O., Jr. System monitor for credit system. 3,787,623, Cl. 179-2.0dp.

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Stevens, Jacques; and George, Michel, to Solvay & Cie. Catalysts and process for the polymerization of olefins. 3,787,384, Cl. 94-9.0da.

Stevens, Travis E., to Rohm & Haas Company. Esters of pentaerythritol and process for preparing. 3,787,465, Cl. 260-440.000.

Stewart, Robert D., to Occidental Petroleum Corporation. Process for manufacturing of antimony trichloride. 3,787,557, Cl. 423-87.000.

Stine, Laurence O.: *See—*
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Stoll, Bernhard: *See—*
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Stoller, Solomon, to Prudential Insurance Company of America, The and Randolph Computer Corporation. Apparatus for controlling movement of objects. 3,787,045, Cl. 271-60.000.

Stolzer, Claus; Hammann, Ingeborg; Unterstenhofer, Gunter; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-alkyl(alkenyl)-N-monoalkyl(alkenyl)-S-(N-monoalkyl (alkenyl)-carbamylmethyl)-thionothiolphosphoric acid ester amides. 3,787,535, Cl. 260-943.00.

Stone, Robert L., to United States of America, Army. Low light level, underwater, viewing device. 3,787,688, Cl. 250-213.0vt.

Stone, Robert L., to United States of America, Army. Boresight alignment device. 3,787,693, Cl. 250-330.000.

Stork, Harald: *See—*
Jahn, Werner; Kampe, Wolfgang; Fauland, Erich; Juhran, Wolfgang; and Stork, Harald, 3,787,391.

Story, Robert S.; and Patel, Arvind S. Replacement motor mounting. 3,787,014, Cl. 248-14.000.

Stout, Karl J., to Ohio Nuclear, Inc. Real time data compression system. 3,787,827, Cl. 340-174.10p.

Stoyer, Paul Eugene: *See—*
Beers, Albert Alvin, Jr.; Stoyer, Paul Eugene; and Lightner, Joseph Campbell, Jr., 3,786,764.

Stradco Inventions & Research Co.: *See—*
Broes, Frank, 3,786,772.

Sturhan, Klaus, to Gebr. Isringhausen. Power driven adjustable seat for automotive vehicle. 3,787,025, Cl. 248-399.000.

Subieta, Carlos. System for automatic identification of calling party's telephone number to receiving party. 3,787,626, Cl. 179-5.500.

Sugahara, Yujiro; Usui, Kouichi; Naito, Hiroyuki; and Matuzawa, Syoji, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Refining agent for oily substances. 3,787,330, Cl. 252-437.000.

Sugden, David B., to Robbins Company, The. Rock cutter assembly. 3,787,101, Cl. 308-15.000.

Sugier, Andre, to Institut Francais du Petrole, des Carburants et Lubrifiants. Carbon monoxide conversion catalysts. 3,787,332, Cl. 252-443.000.

Sugiyama, Hironari: *See—*
Nitta, Kuyata; Sugiyama, Hironari; Takita, Kiyoshi; and Itoh, Hideo, 3,787,217.

Sugiyama, Masayasu: *See—*
Naka, Kanji; Sugiyama, Masayasu; and Nishibori, Saiko, 3,787,413.

Suladze, Ippolit Davidovich: *See—*
Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Suladze, Ippolit Davidovich; Aglitsky, Vladimir Efimovich; Kakhniashvili, Avtandil Semenovich; Kantor, Ilia Solomonovich; Dzhanelidze, Vazha Venediktovich; and Lachinov, Alexandr Alexandrovich, 3787,007.

Sulcek, Charles E.: *See—*
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Sultzbaugh, Lisle W.: *See—*
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Sulzberger, Robert D.: *See—*
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Sumitomo Chemical, Limited: *See—*
Nakashio, Seizo; Takemura, Toshio; Mauyama, Takashi; Ota, Kunio; and Seto, Tetsuki, 3,787,361.

Sun Research and Development Co.: *See—*
Bean, Roger M., 3,787,516.

Sundstrand Corporation: *See—*
Aleem, Mohammed A., 3,786,696.

Suprowich, Wasyl. Ignition key storage device. 3,786,656, Cl. 70-63.000.

Surfalloy Corporation: *See—*
Rausch, John J.; and Van Thyne, Ray J., 3,787,228.

Surgical Appliance Industries, Inc.: *See—*
Lewis, Hector E., 3,786,804.

Sutherland, Alan, to Hepworth and Grandage Limited. Metal casting apparatus with mechanism for emmercing Ng and mould. 3,786,857, Cl. 164-350.000.

Sutter, Raymond C.: *See—*
Meranshian, George; Sutter, Raymond C.; Nimylowycz, Osyp; and White, Wilmer, 3,787,010.

Sutton, Blaine M.; and Weinstock, Joseph, to Smith Kline & French Laboratories. Arthritic compositions comprising an s-(phosphine-or phosphitoaurous)-thiouronium halide and method of producing antiarthritic activity. 3,787,568, Cl. 424-211.000.

Sutton, William H. Apparatus for side pick up refuse collection. 3,786,949, Cl. 214-302.000.

Suzuki, Koji: *See—*
Uchida, Kozo; Nakaya, Naohisa; and Suzuki, Koji, 3,787,749.

Suzuki, Tomohiko: *See—*
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Svenska AB Cleansol: *See—*
Eliasson, Arne Lennart, 3,787,349.

Svenson, Bert N., to Instrument Systems Corporation. Variable ratio belt-type transmission having improved driven pulley. 3,786,688, Cl. 74-230.17m.

Swader, Robert E.: *See—*
McGinnis, Paul H.; McLaughlin, William D., Jr.; and Swader, Robert E., 3,787,265.

Swaim, Frank H., to United States of America, Navy. Restrictive manipulation limited try mechanism for a combination lock. 3,786,658, Cl. 70-333.00r.

Swan, Edward J., to Majestic Lures. Method and article for determining how much line to use when trolling. 3,786,586, Cl. 43-4.000.

Swanson, Ian N., to Donaldson Company, Inc. Exhaust muffler for two-stroke cycle engine. 3,786,897, Cl. 181-54.000.

Swartz, Elmer L., to United States of America, Army. Fluid multi-and logical circuit. 3,786,838, Cl. 137-814.000.

SWF Spezialfabrik fur Autozubehor Gustav Rau GmbH: *See—*
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Swiatek, Henry J.: *See—*
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Swietek, Donald J.: *See—*
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Swiss Aluminium Ltd.: *See—*
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Swodenk, Wolfgang; Scharfe, Gerhard; and Dornfeldt, Wolfram, to Bayer Aktiengesellschaft. Process for the production of palladium acetyl acetonate of low chlorine content. 3,787,462, Cl. 260-429.00j.

Sybron Corporation: *See—*
Schneier, Michael Lawrence, 3,787,829.

Sygnator, Henry A., to Illinois Tool Works, Inc. Chip breaker drill screw. 3,786,713, Cl. 85-41.000.

Symonds, Dean Homer, to Deere & Company. Spout control system. 3,786,945, Cl. 214-42.00a.

Syntex Corporation: *See—*
Fried, John H.; and Harrison, Ian T., 3,787,580.
Matthews, Gary J., 3,787,477

Synthelabo S.A.: *See—*
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T & S Equipment Company: *See—*
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Tabler, Donald C.: *See—*
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 3,787,511.

Tabor, Patrick M. Container for explosive charge. 3,786,956, Cl. 220-63.00r.

Taglinger, Ludwig: *See—*
Kartte, Klaus; Jockers, Kurt; Meier, Hermann; and Taglinger, Ludwig, 3,787,563.

Takagi, Tooru; Shinoyama, Tsuneyoshi; and Satoh, Setsuo, to Orient Watch Co., Ltd. Dial plates for timepieces. 3,786,627, Cl. 58-127.00r.

Takahashi, Tadao; and Kitabayashi, Shoji, to Iwatsu Electric Company, Limited. Method and apparatus for depicting letters patterns and the like on substrates. 3,787,258, Cl. 156-73.000

Takamizawa, Akira; and Sato, Hisao. Certain pyrazolo [1,5-a] pyrimido [4,5-d] pyrimidines. 3,787,408, Cl. 260-256.40f.

Takashi, Yukichi: *See—*
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Tanabe Seiyaku Co. Ltd.: *See—*
Himizu, Junichi; Harigaya, Shoichi; Ishida, Akihiko; Yoshikawa, Kaoru; and Sato, Masanori, 3,787,448.
Tanaka Diecast Co. Ltd.: *See—*
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Tanaka, Hiroshi: *See—*
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Tanaka, Masao: *See—*
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Tanner, Gold & Trask: *See—*
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Tausch, Gilbert H., to Camco, Incorporated. Well safety valve system. 3,786,863, Cl. 166-72.000.
Tausch, Gilbert H.; and Watkins, Fred E., to Camco Incorporated. Lockout for well safety valve. 3,786,865, Cl. 166-274.00s.
Tausch, Gilbert H.; and Watkins, Fred E., to Camco, Incorporated. Lockout for well safety valve. 3,786,866, Cl. 166-224.00s.
Tausch, Gilbert H.; Watkins, Fred E.; and Dietz, William H., to Camco Incorporated. Well safety valve system and method of operation. 3,786,867, Cl. 166-315.000.
Taylor, Charles A.: *See—*
Smith, Robert W.; Ordway, Fred; Taylor, Charles A.; and Zimmerman, William, III, 3,786,777.
Taylor, Charles T., to Gulf Oil Canada Limited. Oil tank skimming device. 3,786,826, Cl. 134-104.000.
Taylor, Paul A.: *See—*
Corkum, James L.; Schoepflin, David; and Taylor, Paul A., 3,786,762.
Taylor, William C., to Automation Devices, Inc. Linear vibratory feeder. 3,786,912, Cl. 198-220.0cc.
Teagno, Weadimiro; and Trevisiol, Franco, to AMP Incorporated. Double thickness P.C.B. flag terminal. 3,787,801, Cl. 339-258.00r.
Tec Group, Inc., The: *See—*
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Technibiotics, Inc.: *See—*
Wolvek, Sidney, 3,786,816.
Technical Processing, Inc.: *See—*
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Tecna Corporation: *See—*
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Tedesco, Raffaele: *See—*
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Teijin Limited: *See—*
Ichikawa, Yataro; Tokashiki, Michiyuki; and Kobayashi, Osamu, 3,787,480.
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Teledyne, Inc.: *See—*
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Teletype Corporation: *See—*
Cook, Harold D., 3,787,618.
Keipert, Hans K., 3,786,693.
Tepper, Sidney; and Fauls, Thomas J., to Educational Toys Inc. Educational toy. 3,786,577, Cl. 35-35.00d.
Terkelsen, Bruce E.: *See—*
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Tesner, Pavel Alexandrovich; Makarov, Konstantin Ivanovich; Ivanov, Alexandr Kornilovich; Robin, Mark Anisimovich; Slavkin, Igor Sergeevich; Pischulin, Alexandr Petrovich; Pokrass, Leonid Mikhailovich; Pochtman, Alexandr Markovich; Sheinfain, Felix Isaakovch; Kondratiev, Evgeny Mikhailovich; Moiseevich, Grigory Isaevich; Osmaga, Igor Ivanovich; and Zhitnik, Greorgy Gavrilovich. Reformer for firing reverberatory furnace and method of operating said reformer. 3,787,038, Cl. 266-24.000.
Tetley, Inc., mesne: *See—*
Borders, Bert; Rivkowich, Harold; and Rehman, Warren C., 3,787,590.
Texaco Inc.: *See—*
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Texas Instruments, Incorporated: *See—*
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Textron, Inc.: *See—*
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Rieth, Kurt A., 3,786,629.
Shank, Gerald G., 3,786,890.
Thaddey, Kurt, to Ciba-Geigy AG. Method of and apparatus for detecting the image fields contained on a strip of film. 3,787,701, Cl. 250-561.000.
Theodore, Ares N.: *See—*
Labana, Santokh S.; and Theodore, Ares N., 3,787,520.
Thiele, Kurt; and Von Bebenburg, Walter E., to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. 2-Benzyl aminopyridine having at least three substituents in the benzyl group. 3,787,429, Cl. 260-295.50c.
Thomas, Carlton E., to KMS Industries, Inc. Coherent optical radar processor. 3,787,842, Cl. 343-5.0pc.
Thomas, Daniel Walter, to American Cyanamid Company. 4,6-Dihydroxy-n,n'bis(3-oxo-1-isoindolinyl-idene) isophthalamide and substitution products. 3,787,438, Cl. 260-325.000.
Thomason-CSF: *See—*
Fritz, Erich; and Bostrowsky, Daniel, 3,787,779.
Thompson, John T.; and Gillemot, George W. Solderless terminal assembly. 3,787,795, Cl. 339-14.00r.
Thompson, William H., to Trans-Clean, Inc., mesne. Correlator for automobile washing installations. 3,786,988, Cl. 238-4.000.
Thomson-CSF: *See—*
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Thorn Electrical Industries Limited: *See—*
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Koppang, Richard R.; and Burge, Harland L., Jr., 3,787,168.
Tietze, Ulrich; Courtin, Erich; and Traub, Stefan, to Hewlett-Packard GmbH. Filter circuitry. 3,787,774, Cl. 328-167.000.
Tjassens, Hindrik. Microwave device. 3,787,782, Cl. 331-107.00r.
Toa Boshoku Kabushiki Kaisha: *See—*
Kimura, Nobuo; and Mizutani, Yukio, 3,786,822.
Tobey, Stephen W., to Dow Chemical Company, The. Disubstituted cyclopropenones and method of production. 3,787,500, Cl. 260-590.000.
Tokashiki, Michiyuki: *See—*
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Tokunaga, Kiyoaki: *See—*
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Tokyo Shibaura Electric Co., Ltd.: *See—*
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Toll, Gerhard; and Lahm, Heinrich, to Index-Werke KG. Multiple tool turret. 3,786,539, Cl. 29-27.000.
Tomomoto, Takamori: *See—*
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Tomy Kogyo Co., Ltd.: *See—*
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Topcik, Barry, to Cities Service Company. Pellets of precipitated silica. 3,787,221, Cl. 106-288.00b.
Topol, George J., to Biospherics Incorporated. Optical sensing sampling head. 3,787,703, Cl. 250-574.000.
Torba, Florence E., to Dow Chemical Company, The. Cyanoalkoxy (trifluoromethyl) pyridines. 3,787,420, Cl. 260-294.900.
Torrington Company, The: *See—*
Alling, Richard L., 3,787,104.
Tourin, Andre Marcel, to Institute Europeen de Recherches et d'Applications Medicales "I.E.R.A.M.". Splint having inflatable detachable cushions. 3,786,805, Cl. 128-87.00r.
Toyo Kogyo Company, Ltd.: *See—*
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Toyota Jidosha Kogko Kabushiki Kaisha: *See—*
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Traut, Bernard E.; and Kiffmeyer, Vernon A., to Washington Scientific Industries, Inc. Coupling assembly. 3,787,125, Cl. 403-13.000.
TRC Industries, Inc.: *See—*
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Trent, Edward J.: *See—*

Meyers, Laverne H.; Kagele, Frank L.; Trent, Edward J.; Fridenberg, Jerry T.; Alberty, Frederick J.; and Fitzgerald, Bloyce D., 3,787,660.
Trevisiol, Franco: *See—*
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Tri-Tech, Inc., mesne: *See—*
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Trumble, Terry M. Ultraviolet radiation dosimeter. 3,787,687, Cl. 250-83.0cd.
Trumper, Joachim: *See—*
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Trutna, Maynard A.: *See—*
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Tucker & Sons: *See—*
Tucker, Emmitt M.; and Tucker, J. Morris, 3,787,099.
Tucker, Emmitt M.; and Tucker, J. Morris, to Tucker & Sons. Endless track unit. 3,787,099, Cl. 305-25.000.
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Turitz, Evelyn. Method of making snack food. 3,787,588, Cl. 426-302.000.
Turoczi, Alexander, Jr. Balanced tire. 3,786,850, Cl. 152-330.000.
Turzillo, Lee A. Means and method for producing stepped concrete slope structures. 3,786,640, Cl. 61-37.000.
Turzillo, Lee A. Means for stabilizing structural layer overlying earth materials in situ. 3,786,641, Cl. 61-63.000.
Twittenhoff, Hans Joachim: *See—*
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Uchida, Kozo; Nakaya, Naohisa; and Suzuki, Koji, to Iwata Electric Company Limited. Automatic synchronizing system. 3,787,749, Cl. 315-19.000.
Uchiyama, Hideaki, to Kabushiki Kaisha Suwa Seikoska. Solar cell watch dial having calendar display window. 3,786,624, Cl. 58-236.000.
Udy, Lex L.: *See—*
Cook, Melvin A.; Udy, Lex L.; Hagmann, Mark J.; and Jessop, Harvey A., 3,787,254.
Uffner, William E., to Owens-Corning Fiberglass Corporation. Glass fiber reinforced elastomers. 3,787,224, Cl. 117-72.000.
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Dickmann, Heinz Hermann; and Krattner, Richard, 3,787,346.
Ulrich, Paul; Max, Basel; Kugler, Fritz; and Jost, Max, to Ciba-Geigy AG. Triazinyl vat dyestuffs. 3,787,406, Cl. 260-249.000.
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Underwood, Jereld L., to Houston Chronical Publishing Company. Web splicing method and apparatus. 3,787,264, Cl. 156-157.000.
Ungerug, Gary A.; Pews, R. Garth; and Dickerson, Richard T., to Dow Chemical Company, The. Fire retardants for polymers. 3,787,506, Cl. 260-613.00r.
Uniflo Systems Company: *See—*
Kleven, Lowell A., 3,786,836.
Union Carbide Corporation: *See—*
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LIST OF DEFENSIVE PUBLICATIONS

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Blount, William W., Jr., R. H. Calendine, and J. L. Suggs. Molding resin compositions. T918,011, 1-22-74, Cl. 260—16.

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Larson, Theodore E.: *See*—
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McNary, Kenneth R.: *See*—
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LIST OF REISSUE PATENTEES

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60 3,786,765
115 3,786,766

CLASS 110
8A 3,786,767

CLASS 112
143 3,786,768
158A 3,786,769
235 3,786,770
255 3,786,771

CLASS 114
43.5 3,786,772
45 3,786,773
66.5R 3,786,774

CLASS 115
.5R 3,786,775

CLASS 116
67R 3,786,776
114AB 3,786,777
132 3,786,778

CLASS 117
21 3,787,222
33.05R 3,787,238
47R 3,787,225
66 3,787,226
69 3,787,223
72 3,787,224
75 3,787,227
102A 3,787,230
114R 3,787,228
114 3,786,882
132BE 3,787,229
138.8A 3,787,231
155UA 3,787,232
201 3,787,233
217 3,787,234
218 3,787,235
227 3,787,236
239 3,787,237

CLASS 118
4 3,786,779

CLASS 119
1 3,786,780
5 3,786,781
14.08 3,786,782
51R 3,786,784
52AF 3,786,783
52A 3,786,786
75 3,786,785
95 3,786,787

CLASS 123
32EA 3,786,788
3,786,789
58C 3,786,790
65EM 3,786,791
90.67 3,786,797
97B 3,786,792
119A 3,786,793
139ST 3,786,794
193H 3,786,795
195R 3,786,796

CLASS 126
343.5A 3,786,800
350R 3,786,798

CLASS 127
1 3,787,241

CLASS 128
2F 3,786,801
24R 3,786,802
75 3,786,803
80C 3,786,804
87R 3,786,805
91A 3,786,799
92D 3,786,806
127 3,786,807
130 3,786,808
191 3,786,809
214.4 3,786,810
218P 3,786,811
260 3,786,812
3,786,813
303.1 3,786,814
321 3,786,815
325 3,786,816
334R 3,786,817

CLASS 131
136 3,786,818

CLASS 132
9 3,786,819
53 3,786,822
74.5 3,786,820
88.5 3,786,821

CLASS 134
2 3,787,239
45 3,786,823
62 3,786,824
99 3,786,825
104 3,786,826

CLASS 136
30 3,787,240
83T 3,787,242
107 3,787,243
120FC 3,787,244

CLASS 137
15 Re.27,895
109 3,786,827
116 3,786,828
202 3,786,829
204 3,786,830
269 3,786,831
403 3,786,832
512.15 3,786,833
540 3,786,834
566 3,786,835
624.2 3,786,836
625.32 3,786,837
814 3,786,838
837 3,786,839

CLASS 139
11 3,786,840

CLASS 140
119 3,786,841

CLASS 141
1 3,786,842
8 3,786,844
13 3,786,843

CLASS 144
32 3,786,845
251 3,786,846

CLASS 145
29R 3,786,847

CLASS 148
6 3,787,245
6.27 3,787,246
9R 3,787,247

11.5A 3,787,248
3,787,249
12 3,787,250
175 3,787,252
3,787,253
187 3,787,251

CLASS 149

60 3,787,254

CLASS 152

209R 3,786,848
210 3,786,849
330 3,786,850
361DM 3,786,851

CLASS 156

51 3,787,255
62.2 3,787,256
73 3,787,257
3,787,258
78 3,787,259
84 3,787,260
3,787,261
123 3,787,262
136 3,787,263
157 3,787,264
167 3,787,265
361 3,787,266
363 3,787,267
425 3,787,268
498 3,787,269
506 3,787,270
554 3,787,271

CLASS 157

1.1 3,786,852

CLASS 161

87 3,787,273
3,787,277
89 3,787,272
116 3,787,274
3,787,275
137 3,787,276
159 3,787,278
160 3,787,279
168 3,787,280
188 3,787,281
195 3,787,282

CLASS 162

36 3,787,283
246 3,787,284

CLASS 164

4 3,786,856
52 3,786,853
80 3,786,854
126 3,786,855
350 3,786,857

CLASS 165

1 3,786,858
9 3,786,868
21 3,786,859
50 3,786,860
105 3,786,861
158 3,786,862

CLASS 166

72 3,786,863
187 3,786,864
224S 3,786,865
3,786,866
315 3,786,867

CLASS 169

24 3,786,869

CLASS 171

129 3,786,870

CLASS 172

4.5 3,786,871
801 3,786,872

CLASS 173

12 3,786,873
49 3,786,874
159 3,786,875

CLASS 174

18 3,787,604
38 Re.27,898
48 3,787,605
65R 3,787,606
88C 3,787,607
159 3,787,608

CLASS 175

18 3,786,876
249 3,786,877
320 3,786,878
374 3,786,879

CLASS 176

78 3,787,285
3,787,286

CLASS 177

1 3,786,880
3 3,786,881
164 3,786,883
210 3,786,884
245 3,786,885

CLASS 178

2R 3,787,613
5.4AC 3,787,611
5.4ST 3,787,609
5.4E 3,787,610
5.4R 3,787,614
5.8AF 3,787,612
6.6A 3,787,616
6.6P 3,787,615
6.8 3,787,618
3,787,619
7.1 3,787,620

CLASS 179

1GQ 3,787,622
1HF 3,787,621
2DP 3,787,623
2A 3,787,624
5.5 3,787,626
6R 3,787,625
15AT 3,787,630
3,787,631
15BA 3,787,627
15BF 3,787,628
15BS 3,787,634
15BT 3,787,629
18ES 3,787,635
18FH 3,787,632
18J 3,787,633
90K 3,787,639
99 3,787,640
100.2CA 3,787,644
100.2CH 3,787,638
100.2MD 3,787,637
100.2B 3,787,617
100.2T 3,787,636
107BC 3,787,641
107E 3,787,643
111E 3,787,642
170.2 3,787,645
189D 3,787,646

CLASS 180

5R 3,786,886
6.5 3,786,887
24.11 3,786,888
44E 3,786,889
64A 3,786,890
68R 3,786,891
99 3,786,892
119 3,786,893

CLASS 181

.5BE 3,786,894
33G 3,786,898
49 3,786,895
53 3,786,896
54 3,786,897

CLASS 182

93 3,786,899
172 3,786,900

CLASS 184

6.18 3,786,901

CLASS 187

9 3,786,902

CLASS 192

91R 3,786,903
107R 3,786,904

CLASS 195

29 3,787,287
36P 3,787,288
65 3,787,289
103.5R 3,787,290
127 3,787,291

CLASS 197

17 3,786,905
161 3,786,906
181 3,786,907

CLASS 198

33AB 3,786,908
131 3,786,909
158 3,786,910
219 3,786,911
220CC 3,786,912

CLASS 200

61.04 3,787,650
61.47 3,787,647
146R 3,787,651
148A 3,787,652
148J 3,787,648
153LA 3,787,649
153K 3,787,653
170A 3,787,654

CLASS 202

118 3,787,292

CLASS 204

1R 3,787,293
16 3,787,294
35N 3,787,295
55R 3,787,296
3,787,297
58 3,787,298
59R 3,787,299
67 3,787,300
105R 3,787,306
112 3,787,301
159.15 3,787,303
159.2 3,787,302
180P 3,787,304
181 Re.27,896
3,787,305
195G 3,787,307
195M 3,787,309
195P 3,787,308
243R 3,787,310
294 3,787,311
298 3,787,312

CLASS 206

1.8 3,786,913
44R 3,786,914
45.15 3,786,915

CLASS 208

60 3,787,313
3,787,314
208M 3,787,315

CLASS 209

80.5 3,786,916
123 3,786,917
273 3,786,918
434 3,786,919

CLASS 210

6 3,787,316
31C 3,787,317
65 3,787,318
90 3,786,920
130 3,786,921
136 3,786,922
152 3,786,923
257 3,786,924
321 3,786,925
497 3,786,926

CLASS 211

4 3,786,927
5 3,786,928
40 3,786,931
60A 3,786,932
90 3,786,933
182 3,786,934

CLASS 212

11 3,786,935
3,786,936
59 3,786,937

CLASS 214

1BD 3,786,938
11A 3,786,939
16.1CB 3,786,930
16.1ED 3,786,940
16.4A 3,786,929
3,786,942
3,786,943
3,786,944
42A 3,786,945
75R 3,786,947
83.1 3,786,941
130C 3,786,948
152 3,786,946
302 3,786,949
506 3,786,950
512 3,786,951
731 3,786,952
776 3,786,953

CLASS 215

40 3,786,954

CLASS 219

72 3,787,655
104 3,787,656
117HD 3,787,657
146 3,787,658
314 3,787,659

CLASS 220

54 Re.27,897
55E 3,786,955
63R 3,786,956
83 3,786,957

CLASS 221

67 3,786,958
261 3,786,959

CLASS 222

2 3,786,960
55 3,786,961
56 3,786,962
136 3,786,963
153 3,786,964
176 3,786,965
387 3,786,966
397 3,786,967
402.11 3,786,968
561 3,786,969

CLASS 223

15 3,786,970
83 3,786,971

CLASS 224

31 3,786,972

CLASS 225

2 3,786,973

CLASS 226

19 3,786,974
48 3,786,976
194 3,786,975

CLASS 227

8 3,786,977
3,786,978
44 3,786,979
120 3,786,980

CLASS 228

4 3,786,981

CLASS 229

2.5 3,786,982
51WB 3,786,983
69 3,786,984

CLASS 233

26 3,786,985
3,786,986

CLASS 234

2 3,786,987

CLASS 235

54F 3,787,662
61.11D 3,787,661
61.9R 3,787,660
92SB 3,787,664
92C 3,787,663
150.23 3,787,665
150.26 3,787,671
151 3,787,666
151.1 3,787,667
152 3,787,668
3,787,669
153AC 3,787,670
153BD 3,787,672
156 3,787,673

CLASS 238

4 3,786,988
14 3,786,989

CLASS 239

112 3,786,990
236 3,786,991
265.19 3,786,993
265.39 3,786,992
428.5 3,786,995
569 3,786,994

CLASS 240

2PA 3,787,674
2.13 3,787,677
10.6C4 3,787,678
10.6SD 3,787,675
108R 3,787,676

CLASS 241

46.17 3,786,996
101.7 3,786,997
3,786,998
282.1 3,786,999

CLASS 242

1.1R 3,787,000
75.43 3,787,001
107.4 3,787,002
192 3,787,003
204 3,787,004
205 3,787,005

CLASS 243

6 3,787,006
33 3,787,007
35 3,787,008

CLASS 244

83E 3,787,009
137R 3,787,012
146 3,787,010
150 3,787,011
155R 3,787,013

CLASS 246

30 3,787,679
377 3,787,680

CLASS 248

14 3,787,014
43 3,787,015
49 3,787,016
96 3,787,017
165 3,787,018
188.2 3,787,019
316B 3,787,021
361B 3,787,024
399 3,787,025

CLASS 249

18 3,787,020

CLASS 250

41.9SB 3,787,681
43.5FL 3,787,682
43.5D 3,787,683
71R 3,787,684
71.5S 3,787,685
83CD 3,787,687
83.3R 3,787,686
213VT 3,787,688
219FR 3,787,689
231R 3,787,690
272 3,787,691
305 3,787,692
311 3,787,696
330 3,787,693
338 3,787,694
365 3,787,695
390 3,787,697
473 3,787,698
507 3,787,699
560 3,787,700
561 3,787,701
3,787,702
574 3,787,703

CLASS 251

61.1 3,787,026
63 3,787,027
212 3,787,022
317 3,787,028
333 3,787,029
335B 3,787,023

CLASS 252

8.55E 3,787,319
54 3,787,320
301.1R 3,787,321
316 3,787,327
427 3,787,328
431R 3,787,329
437 3,787,330
442 3,787,331
443 3,787,332
465 3,787,322
3,787,333
468 3,787,334
472 3,787,335
511 3,787,336
545 3,787,337

CLASS 254

8R 3,787,030
172 3,787,031
190 3,787,032

CLASS 256

59 3,787,033

CLASS 259

3 3,787,034
16 3,787,035

CLASS 260

2.1R 3,787,339
23XA 3,787,340
23.7M 3,787,341
24 3,787,342
28 3,787,343
28.5A 3,787,344
28.5R 3,787,345
3,787,346
29.2N 3,787,338
30.4EP 3,787,347
32.6NA 3,787,348
37EP 3,787,349
38 3,787,350
40R 3,787,351
41AG 3,787,352
45.75B 3,787,356
45.75K 3,787,357
45.75R 3,787,355
45.9P 3,787,353
45.9R 3,787,354
47ET 3,787,358
3,787,361
3,787,362
47XA 3,787,359
47P 3,787,360
49 3,787,363
61 3,787,364
63N 3,787,365
64 3,787,366
65 3,787,367
67.6R 3,787,368
75H 3,787,369
75R 3,787,370
78A 3,787,373
78R 3,787,371
3,787,372
3,787,375
78.4D 3,787,374
79 3,787,376
80.72 3,787,380
83.7 3,787,377
86.1R 3,787,378
87.5A 3,787,379
87.5C 3,787,381
88.2F 3,787,323
92.1R 3,787,382
92.8R 3,787,383
94.9DA 3,787,384
112.5 3,787,385
3,787,386
145A 3,787,387
155 3,787,388
210R 3,787,389
3,787,390
211.5R 3,787,391
3,787,392
239BF 3,787,393
239.5SC 3,787,395
239.55R 3,787,394
239.57 3,787,396
240E 3,787,397
243A 3,787,413
243R 3,787,324
3,787,398
3,787,399
3,787,400
3,787,401
3,787,402
3,787,403
3,787,404
246B 3,787,414
249 3,787,406
249.6 3,787,407
250R 3,787,415
251R 3,787,416
256.4F 3,787,408
256.4N 3,787,409
256.5R 3,787,410
260 3,787,405
268BC 3,787,411
270R 3,787,417
279R 3,787,412
287R 3,787,325
3,787,418
293.77 3,787,419
294.08G 3,787,425
294.8C 3,787,421
294.8F 3,787,422
294.9 3,787,420
295T 3,787,424
295.5C 3,787,429
295.5R 3,787,423
296D 3,787,426
3,787,427
3,787,428
296H 3,787,430
306.7 3,787,431
306.8D 3,787,432
3,787,434
306.8R 3,787,433
309 3,787,437
309.2 3,787,435
309.6 3,787,436
325 3,787,438
326E 3,787,439
326.1 3,787,440
327TH 3,787,442
327B 3,787,444
327E 3,787,443
327S 3,787,441
332.32R 3,787,445
340.9 3,787,446
343.3 3,787,447
343.6 Re.27,894
3,787,448
345.7 3,787,449
345.9 3,787,450
348SC 3,787,452
348R 3,787,451
397.4 3,787,453
397.45 3,787,454
404 3,787,455
3,787,456
3,787,457
404.5 3,787,458
410.7 3,787,459
418 3,787,460
429J 3,787,462
429R 3,787,461
430 3,787,463
438.5R 3,787,326
439R 3,787,464
440 3,787,465
448R 3,787,466
448.8R 3,787,467
449M 3,787,468
453A 3,787,469
453R 3,787,470
454 3,787,472
455A 3,787,471
455B 3,787,473
459 3,787,474
465D 3,787,476
465F 3,787,475
3,787,477
471R 3,787,478
475PR 3,787,480
475P 3,787,479
3,787,481
482B 3,787,483
482P 3,787,482
488H 3,787,484
491 3,787,485
502.4R 3,787,486
515P 3,787,487
537S 3,787,488
544F 3,787,489
552R 3,787,490
553D 3,787,491
553R 3,787,492
557R 3,787,493
3,787,494
570.5R 3,787,495
577 3,787,496
583N 3,787,497
586B 3,787,498

586R 3,787,499
590 3,787,500
592 3,787,501
609C 3,787,502
610R 3,787,503
3,787,504
612R 3,787,505
613R 3,787,506
3,787,508
619A 3,787,507
652.5R 3,787,509
665R 3,787,510
666A 3,787,511
668C 3,787,512
3,787,513
677H 3,787,514
681.5 3,787,515
683.3 3,787,516
3,787,517
683.45 3,787,518
834 3,787,519
836 3,787,520
3,787,521
3,787,522
857PG 3,787,523
3,787,524
859R 3,787,525
860 3,787,526
861 3,787,527
865 3,787,528
3,787,529
873 3,787,530
876B 3,787,531
876R 3,787,532
924 3,787,533
928 3,787,534
943 3,787,535
3,787,536
953 3,787,537
954 3,787,538
959 3,787,539
970 3,787,540

CLASS 261

29 3,787,036
130 3,787,037

CLASS 264

29 3,787,541
40 3,787,552
51 3,787,542
53 3,787,543
69 3,787,544
88 3,787,550
135 3,787,545
156 3,787,546
249 3,787,547
259 3,787,548
274 3,787,549
345 3,787,551

CLASS 266

24 3,787,038

CLASS 269

13 3,787,039
58 3,787,040

CLASS 270

64 3,787,041
70 3,787,042
71 3,787,043

CLASS 271

27 3,787,044
60 3,787,045

CLASS 272

29 3,787,046
57B 3,787,047
57R 3,787,048
58 3,787,049

CLASS 273

1R 3,787,050
73F 3,787,051
101 3,787,052
3,787,053
109 3,787,054
110 3,787,055
134C 3,787,056

CLASS 274

4B 3,787,057
4G 3,787,058

CLASS 277

1 3,787,059
69 3,787,060
164 3,787,061

CLASS 280

11.35T 3,787,062
3,787,070
28 3,787,071
33.99F 3,787,063
79.1 3,787,072
93 3,787,064
124A 3,787,073
150AB 3,787,067
3,787,074
3,787,075
204 3,787,065
217 3,787,066
435 3,787,076
446B 3,787,077
446R 3,787,068
486 3,787,069

CLASS 285

189 3,787,078
233 3,787,079
341 3,787,080

CLASS 289

17 3,787,081

CLASS 292

281 3,787,082

CLASS 293

88 3,787,083

CLASS 294

71 3,787,084

CLASS 296

28C 3,787,085
3,787,087
65R 3,787,086
78.1 3,787,088

CLASS 297

118 3,787,089

CLASS 299

43 3,787,090
84 3,787,091

CLASS 301

63R 3,787,092

CLASS 3u2

61 3,787,093

CLASS 303

10 3,787,094
21F 3,787,095
24F 3,787,096

CLASS 305

10 3,787,097
11 3,787,098
25 3,787,099

CLASS 307

41 3,787,728
3,787,729
77 3,787,730
115 3,787,731
116 3,787,732
118 3,787,733
203 3,787,734
3,787,735
205 3,787,736
215 3,787,737
237 3,787,738
255 3,787,739
293 3,787,740

CLASS 308

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15 3,787,101
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U. S. GOVERNMENT PRINTING OFFICE : O - 1974

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, *Secretary*